ERNST VAN DE WETERING

REMBRANDT

The Painter at Work

REVISED EDITION

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front cover Rembrandt, The Artist in his Studio, c. 1629, detail. Panel, 25.1 x 31.9 cm. Boston, Museum of Fine Arts. The eyes in the Boston painting that were painted over with misleading black stains (see fig. 102) have been digitally retouched on the front cover.

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[h1] Preface

[h2] Preface to the first edition (abridged)

a15Is every 'Rembrandt' a Rembrandt? That question triggered the founding of the Rembrandt Research Project (rrp) in 1968. nwo, the Dutch national research foundation enabled the scholars and scientists involved to embark on this ambitious project of multidisciplinary research.

Not only are there works by his contemporaries in Rembrandt's style that can be been mistaken for originals, there are also later imitations to contend with, while on the other hand the originals have sometimes been so badly disfigured by later 'restorations' that they have virtually become unrecognizable as Rembrandts. Whereas the disputations of the connoisseurs in such instances had usually been based on arguments over quality and style, the rrp from the outset tried to employ technical arguments as well. However, technical criteria of authenticity could only be developed while closely assessing the paintings themselves, if possible with the help of X-radiographs and other technical information. And there lie the roots of this book.

Years of close scrutiny of paintings by or in the style of Rembrandt were spent trying to establish what aspects of these paintings might be typical for Rembrandt, in the anticipation that these could eventually be used as criteria of authenticity. Separate research projects were developed around particular technical aspects. These side-projects were also necessary as questions other than those of authenticity became urgent.

The fact that in 1969 I had become a staff member of the Central Research Laboratory for Objects of Art and Science in Amsterdam allowed me to devote considerable time to these sub-projects. Apart from providing more insight into Rembrandt's working method and his use of materials, these projects generated a new understanding of various aspects of seventeenth-century workshop practice and its theoretical background in general. As so often in science, probing in depth one single spot in art history, in this case Rembrandt's painted oeuvre, opened up unexpected vistas of a much wider field. These wider views were the reasons it seemed worthwhile to publish this book.

Whilst writing, every author has one or more readers in mind. The readers I had in mind were not only Rembrandt specialists. I dreamed of addressing all those with an interest in art, hoping they would share my sense that it is a rare privilege to look over the shoulder of a great artist at work and to hear him think. I also wanted to address my colleagues in the fields of art history, restoration and scientific inquiry of paintings, hoping that this integrated approach might serve to illuminate their work in related fields.

Being originally trained as an artist, I have always imagined some painters among my readers as well. With the disappearance of the traditional workshop a16training of artists around 1800, much knowledge has been lost – irretrievably, it would seem. Nevertheless, current efforts by a number of researchers in different countries to reconstruct historical

painting practices and the *ratio* behind them are slowly compensating for some of these losses. This book is a contribution to that effort.

Above all, however, whilst writing I had in mind my students in the field of art history and restoration and young scientists specializing in this field. The range of this book, from practical workshop devices to aesthetic and art theoretical matters, offers a view of the daily practice and the artistic considerations of a painter like Rembrandt which should provide a more-dimensional image of the historical artist in general.

My hope that it will serve a useful function for students should not, however, imply that this book is intended to be a compendium of knowledge in the field. Although it covers a broad, well-defined area, it is rather a personal account of the research I have been engaged in – with the help of many others – over a period of almost thirty years. Accounts of the struggles involved in the resolution of problems are sometimes preferable to the more balanced presentation of available knowledge and, as an account of several such adventures in research, I hope this book will inspire those who enjoy inquiry as much as I do. I also hope that the discussion of the results of research in this field, as well as the research-methods applied, will make the reader aware of the relativity of scientific 'truth'.

Several of the Chapters were published earlier in separate form. It required some outside compulsion – notably from my friend IJsbrand Hummelen – to collect these publications together and to try to bring them to a synthesis. Several Chapters (I, VIII, IX, XI) have been written especially for this book or, as in the case of Chapter V, rewritten for this occasion. A book like this cannot exist without a great deal of adequate illustration. I am grateful that the chemical corporation dsm, with whose scientific researchers we have closely collaborated between 1990 and 1998, has made it possible to make this book and to illustrate it so lavishly. Thanks to this generosity, it was possible to visualize almost every step in the text, providing the reader, as it were, with a multiplicity of clear windows upon Rembrandt at work.

The reader may also note that almost as many other windows on to the past are provided by the many quotes from historical sources that have been incorporated in the text. One sometimes hears it said that quoting texts by others is an easy way to fill a book. But these texts, often surviving to the present only by a miracle, are primarily quoted in order to serve as little time-machines that transport us back into the past and help us understand the thinking of the book's protagonist – and occasionally even give a voice to an otherwise remarkably taciturn Rembrandt.

The work of art as a material object is increasingly used in art historical research as an important source of evidence about itself. Whereas in the past the painting was mainly used as a source of stylistic and iconographic features, an 'archaeology' of the art work is now developing. It has become the usual practice for such research into the painting – which by nature is interdisciplinary – to be presented by a team of specialists from the several disciplines involved. However, I have learned over the years that it is essential for members of the different disciplines to be able to step over the thresholds that keep their disciplines divided. One should never be too polite here, for the chance of misunderstandings arising in interdisciplinary research is all too evident. The fact that I have taken the liberty of relating in my own words the contributions to my research made by those in disciplines that are not my own is not just a matter of popularizing research from these fields: I believe it is beneficial for all involved, in whatever specialist field we actually operate ourselves, to evaluate the results of different methods in the

overall context when aiming at a larger goal. It will nevertheless be clear that a book like this could only be written thanks to the collaboration with many specialists and with the help and inspiration of many people.

[h2] Acknowledgements

First of all I wish to thank the original members of the Rembrandt Research Project, Josua Bruyn, Bob Haak, Simon Levie and Pieter van Thiel. They invited me to assist them, kept me on and incorporated me in their team.

Without the support of nwo and other sponsors we would never have had the possibility of studying so many paintings *in situ* or of publishing our discoveries. In addition, without the hospitality and support of many directors, curators, conservators and scientists associated with the museums we visited, and without the graciousness of those who privately own a Rembrandt, we would never have been able to enjoy such – often ideal – conditions to study their Rembrandts. We met countless people who helped us greatly during our research trips, many of whom have become valued colleagues, and some even life-long friends. Discussions with some of them have greatly contributed to the development of the ideas set out in this book.

The successive directors of the Central Laboratory of Objects of Art and Science (now The Netherlands Institute for Cultural Heritage, icn), during the period of seventeen years that I was a staff member there, had the kindness to enable me to spend part of my time on the sub-a18projects discussed in Chapters II, V, VI and IX. A close collaboration with my colleague and dear friend, research chemist Karin Groen, also began in this laboratory and has lasted to the present day. In the same laboratory, a steady stream of interns, and temporary assistants, including Michiel Franken, and volunteers came to participate in particular aspects of these projects. Later, after I had moved to the University of Amsterdam in 1987, colleagues, graduate and undergraduate students, both individually and in seminars and whose names are mentioned in the first note of each of the relevant Chapters, all contributed in their own ways.

For a book in which images often are more telling than words, the contribution of photographers is essential. Many of them, although masters in their profession, remain anonymous. With others, like Ton de Beer, Ernst Klusman and especially René Gerritsen, I have worked closely. I am grateful to them all.

In writing the book, I have received essential help from Carin van Nes and Diederik Paauwe, while Jacques Vis, Achim Dudde, Cynthia van der Leden and Wardy Poelstra worked tirelesly to help prepare the book for its final printing.

The book's long genesis implies that various translators were involved. Working with translators is an enriching experience as their scrutiny of the text invariably leads to improvements and refinements, not only to the wording but also the thinking of the text. I am grateful to the translators Derry Cook-Redmore (Chapters II and V), Michael Hoyle (Chapter VII), Mandy Sickens (Chapters III, VI and X), Murray Pearson (Chapters I, IV, VIII, IX, and part of XI) and Marijke Koch (part of Chapter XI). They should not, however, be held entirely responsible for the English in the Chapters they translated.

Even Marijke Koch, who has edited the English manuscript with great love and patience, cannot be held responsible for the English text as a whole, since even in the proofs I continued to intrude into her work and that of the others with my own Pidgin English whilst continuing to make additions and changes in the text.

The publisher, Saskia de Vries, who simultaneously managed to encourage and to fear this pursuit of the phantom Perfection, deserves gratitude and admiration. She was not alone in her sufferance. The patience of Kok Korpershoek, the designer of this book, was seriously put to the test by my countless wishes for changes and corrections. My colleagues of the Rembrandt Research Project and the Art Historical Institute of the University of Amsterdam have also endured much on behalf of this enterprise.

Mireille te Marvelde – whose life was seriously disrupted by all this – has supported me with patience and grace.

I dedicate this book to the memory of my dear parents Anna Maria Bahlmann (1904-1977) and Gerardus Hermanus van de Wetering (1904-1988).

Amsterdam, May 1997

[h3] Preface to the present edition; summary of the book and additional insights after 1997

Ten years have passed since this book first appeared and I note with satisfaction – and gratitude – that it has been read and used by many. In its most important aspects, this edition is identical to the first; apart from minor corrections the main text has not been altered and the pagination remains unchanged. Additional relevant illustrations have been included on those pages at the end of most Chapters that were previously left blank; they have been given a and b figure numbers. The most significant new additions, in fact, are to be found in this preface.

Since the appearance of the first edition in 1997, the work of the Rembrandt Research Project has continued unabated. Up to 2005, our attention was almost entirely devoted to Rembrandt's self-portraits, dealt with in *A corpus of Rembrandt paintings*, Vol. IV, published in that year.[1] [For the notes regarding this Preface, see p. 311.] In 2006 Rembrandt's 400th anniversary was celebrated with innumerable cultural events, exhibitions and publications. The rrp was heavily involved in some of these. In that context new insights emerged in several areas already discussed in the first edition of this book. I have chosen to leave the original Chapters unchanged and to integrate those new findings and ideas, together with the appropriate references, in the summaries of the book's Chapters, which are presented in this preface.

[h3] Chapter I. Rembrandt. An alchemist? (p. 3-9)

a22*Subtitles: Workshop secrets.*
The Self-Supporting Studio?

The balance has not yet settled in our perception of Rembrandt's method of working: between, on the one hand, studio-routine according to traditional methods handed on from generation to generation and, on the other hand, Rembrandt's own contributions to this evolving tradition, contributions that may have been kept as workshop secrets. To give an example: extrapolating from the insights developed in Chapter V, we

thought that Rembrandt as a rule bought his canvases readymade from professional primers or dealers in painters' materials. It only became clear in 2003 that from c. 1640 he had most canvases – for use either by himself or his pupils – prepared in his own workshop with a mixture of milled sand, clay and oil, a ground encountered in no other Amsterdam paintings from the period and therefore not used by professional primers or other painters in Amsterdam in the period 1640 and 1670.[2] Had we stumbled on one of Rembrandt's workshop secrets? Possibly; but more importantly, in the case of doubted paintings executed on such a quartz ground, we could now establish with certainty that they had originated in Rembrandt's workshop. This further meant that we could now be certain that some of the 'self-portraits', rejected on stylistic grounds, must have been painted in Rembrandt's workshop by others (see, for example, fig. 16).[3]

[h3] Chapter II. Painting Materials and Working Methods of the Young Rembrandt (pp. 11-45)

Subtitles: The Support. The Ground. The First Sketch, the Monochrome Underpainting and the First Lay-in of Colour. The 'Working-up'

This Chapter was first published (in Dutch) in 1977. It is based on research begun in 1968 and intensified between 1973 and '76. The outcome of that research was a much clearer understanding that Rembrandt's early working method and use of materials was based on a rational and economical workshop practice that had been developed in Southern- and Northern-Netherlandish workshops since the 15th century. Each aspect of material practice that we investigated had its own rationale, which we were able to discover on the basis of accurate descriptions of the material making of the works painted by Rembrandt in his first period. This new knowledge was deepened by further observations using scientific techniques such as X-radiography.

The theories generated by this work could be tested in depth on a number of early paintings in the Netherlands that were available for still more detailed investigation. Moreover, it was gratifying to discover that there exists an abundance of seventeenth century texts, never previously recognized as relevant, which actually confirmed and elucidated these new insights into the painterly craft as practiced in seventeenth century workshops, including Rembrandt's. Given the wealth of this evidence, I thought at first that this Chapter could be considered closed. However, the discovery of some totally unexpected insights in how Rembrandt and his contemporaries used the palette (described in Chapter VI) demonstrated the fact that – needless to say – a chapter is never closed.

Moreover, this idea of the young Rembrandt as a craftsman rooted in traditional workshop practice certainly did not do him full justice. In the same years he was also one of the most adventurous seekers, investigating a range of pictorial possibilities. For example, there are his explorations – together with the Leiden painter Jan Lievens – of a profusion of effects for the rendering of surface textures. These are analyzed in Chapter VII (p. 173-178). But this was only one aspect of Rembrandt's early experiments. It seems as though, at this stage of his development, he was investigating the possibilities of the art of painting from all sorts of perspective: light

and light reflections, the use of colour in relation to the suggestion of space, compositional resources and, with regard to the representation of his figures, their interactions, attitudes and affects, the rendering of the human skin, the fall and pleating of materials etc. These artistic adventures are discussed at length in *Corpus* V.[4] However, Rembrandt's explorations ultimately occured within the framework of the traditional working procedures described specifically in Chapters II, VI, VII-X.

[h3] Chapter III. Lost drawings and the use of erasable drawing boards and 'tafeletten' (pp. 46-73)

Subtitles: Lost Drawing Exercises. 'Tavolette'. Drawing Tablets in Seventeenth-Century Prints, a False Lead?. 'Tafeletten' and 'Tablets à Papier'. Surviving Dutch 'Tafeletten'

This Chapter is devoted to what I have called 'a black hole in art history' – the gaping hole into which countless drawings (as well as even more notes of a different kind) have disappeared: these drawings were done with a metal stylus on erasable boards and sheets (often bound in booklets), the so-called '*tafeletten*', from which they were subsequently wiped or washed off to make way for new drawings. This Chapter is included in the book not only because Rembrandt also drew on *tafeletten* – three of them have been preserved (figs. 47, 48/49, 95/96). More importantly, as a result of the discovery of this black hole in the history of art, the many drawings on a28paper that have been preserved need to be looked at with different eyes. Apparently, they were done on paper with the intention that they should be preserved, as distinct from the drawings done on *tafeletten*. Because many exercises of aspiring artists must clearly have been done on *tafeletten*, this Chapter also provides a good opportunity to look at the training of painters' pupils – and implicitly of the young Rembrandt too (his own pupils as a rule would have already had this basic training before they entered his workshop).

The phenomenon of erasable *tafeletten*, used on a wide scale from the 15th up to the 19th century, had completely disappeared from the collective memory of Western culture. It is to be hoped that someone can be found to investigate this art historical phenomenon for more than the few weeks that I had at my disposal to conduct the research and write the article on which this Chapter is based. This is an appeal for interested young researchers to contact rrp-fgw@uva.nl in order to avoid duplication of work.[5]

[h3] Chapter IV. The creation of the pictorial idea (p. 75-89)

Subtitles: On the Function of Drawings. The Painting Contest. Rembrandt's Studio Scene in Boston and its Art-Theoretical Statement

When in the course of the twentieth century it became ever clearer that seventeenth century genre scenes – including depictions of painters' studios – were not simply snapshots from the everyday life of that time, the question arose as to what precisely could have been the meaning of Rembrandt's intriguing workshop scene in Boston (fig. 102). This question became all the more compelling as we began to understand

that the depictions of working studios were the equivalent of the visits paid by art-lovers to artists' studios in pursuit of knowledge of the art of painting.[6] What precisely was the knowledge that this Boston painting was meant to convey?

My hypothesis, developed in this Chapter, is that in the Boston painting Rembrandt was showing how the artist first developed the 'idea' or invention in his imagination before he began work – a precept already familiar from classical works on rhetoric intended for orators. If it is true that this was the message Rembrandt conveyed in this painting, this could be taken as his approach to conceiving a painting. This in turn would have significant consequences for our insight into Rembrandt's way of working. It would mean, for example, that he did not – as a rule – make use of preparatory designs for his compositions, but that he sketched his inventions directly on his panel or canvas. The working method described in Chapter II, a step-wise process, allowed all possibilities for introducing changes during that process. That did in fact happen, as we know from technical investigations (see figs. 42/43 and 103-106). This interpretation of the Boston painting thus has far-reaching consequences for the question of the function of Rembrandt's drawings. In general, they were apparently not, as was long thought, made in preparation of his paintings or etchings but should rather be seen as exercises in their own right.

If Rembrandt's drawings were not generally made for preparatory purposes, there are nevertheless other questions to be asked about the use of images produced in the course of the making of his paintings. For example, with reference to Chapter III, one may wonder whether he might have used his *tafelet* for his very first sketches. However, considering the above evidence, I am not inclined to think so. What I have come to believe increasingly firmly is that, in order to solve certain problems whilst painting, Rembrandt occasionally made drawings preparatory to changes in a composition (see p. 75/77) and also studies in oil-paints, mostly of heads or half-figures.[7] Oil studies should not be confused with the oil sketches, which Rembrandt made in preparation for etchings to be executed by graphic artists specialized in the making of reproduction prints, such as J.G. van Vliet with whom Rembrandt collaborated closely.[8]

[h3] Chapter V. The canvas support (p. 90-131)

Subtitles: Introduction. Radiographs as a Means of Studying the Canvas. Historic Sources on the Nature and Origin of Canvas Used by Painters. Thread Density. Problems in Determining the Warp Direction. Thread Density and Weave Characteristics of Canvases by or Attributed to Rembrandt. Interpreting Cusping. Strip Widths and Painting Formats. Some Remarks on the Grounds of Rembrandt's Canvases

This Chapter demonstrates how tedious, at first sight even irrelevant, and yet in the outcome how exciting scientific investigation can sometimes be. The research described here had its origin in my dissatisfaction with connoisseurship: that is, reliance solely on the experienced eye in the attribution or disattribution of paintings in our case to or from Rembrandt. Against this connoisseurial approach, I thought that everything first had to be measured, counted, and thoroughly investigated for its technical structure before the 'yea' or the 'nay' of the connoisseur be given any

weight. Even the threads of the painting's linen canvas had to be counted. Who knows what it might yield?

If there was ever an occasion to investigate the canvases of paintings in this manner, it was in the context of the Rembrandt Research Project. The necessary X-radiographs from hundreds of a35paintings had already been systematically collected. In addition, historical methods for stretching linen could be investigated and the various standard widths of rolls of linen could also be measured. Such research may seem at first sight pointlessly time-consuming, for how on earth could one attribute – or disattribute – a painting in the style of Rembrandt on the basis of the average number of threads per centimeter in the canvas, and on the width of the linen or the length and depth of the stretchmarks in the fabric? But if one perseveres, it turns out that such data contribute to the transparency, as it were, of the painting and afford significant insight into particular aspects of both workshop practice and the procurement and supply of materials in Rembrandt's time. Moreover, these investigations ultimately enabled us to see important works of Rembrandt such as his *Danaë*, the *Belshazar* (figs. 158-163) and *The* (controversial) *Mill* in Washington in a significantly different light.[9]

However, in our enthusiasm to record the results of this research, insufficient attention was paid to the publication of the methodology we had developed for measuring and evaluating the thread density of canvases. If others wanted to continue this or similar research, they needed to do so according to a standard, generally used method. This omission was made good in 2008 in an article which (in combination with the Chapter in this book) can serve as a methodological guide for such investigations.[10] It is interesting that a start has now been made with the digital counting of canvas threads and the computer-assisted interpretation of data in the case of the paintings of Vincent van Gogh.[11] It has already become evident that the two approaches are able to reinforce each other.

Chapter V ends with some remarks on the priming of canvases. Since 1997, research in that field has assumed an accelerated momentum. As described in this Preface, under Chapter I, extremely interesting results have come from the investigation of the grounds of canvases used by Rembrandt and the painters in his workshop (see notes 2 and 3).

[h3] Chapter VI. The palette; on the relationship between style and painting technique (p. 132-153)

Subtitles: Selective Palettes. The Development of the Palette as a Tool. Palettes for the Blue Robe, a White Horse or Human Skin. Technical Limitations. Rembrandt's Use of Limited Palettes and the Concept of 'Houding'

With some scientific discoveries, all the elements are already in place and yet the last step has still not been taken, so that a new insight remains suspended, as it were, in a potential state. Such was the case with the discovery described in this Chapter. Once I realized that the early Rembrandt worked out his monochrome conceptions passage by passage, from back- to foreground (Chapter II, p. 32-44), this discovery was staring us in the face. Moreover, it had already struck our scientist, Karin Groen, that Rembrandt's mixtures – even in exceedingly complex paintings – are almost always

surprisingly simple. I was also aware of the existence of what at first sight seemed almost comically simple seventeenthcentury recipes for the mixture of pigments – usually only a few pigments for each recipe – for painting almost every object on the face of the earth. But still the penny failed to drop.

That eventually happened in 1981 when I made an experimental painting following what, at the time, I took Rembrandt's technique to be. This experimental painting was executed during the neutronactivation autoradiography project in the Metropolitan Museum in New York, which was mainly carried out by Maryan Ainsworth and Pieter Meyers. This was where Karin Groen and I were invited to participate in the interpretation of the images of Rembrandt's paintings obtained by this technique (see for instance figs. 185/86). My experimental painting was done with the correct pigments and, as I thought, according to the correct procedure, with a medium-large palette arranged with all the necessary pigments and a substantial bundle of brushes.

When this dummy, a portrait, was investigated with neutron-activation autoradiography, it was found to differ fundamentally from all the paintings by Rembrandt that had been investigated by this method: all the pigments that had been used appeared *everywhere* in my painting, although in varying quantities, while the autograph Rembrandts mostly showed well-defined islands per pigment (as far as the atoms involved emitted traceable radiation). There was only one explanation for this difference. All the pigments, in varying quantities and sometimes only in traces, must have been all over my palette and in [the roots of] my constantly but insufficiently cleaned brushes.

That was when the idea was born of the use of separate palettes for different passages in the art of oil painting, an idea that would subsequently be confirmed by various written sources. Once you know this, you see it in the paintings. In this case, technique and style turn out to be more profoundly connected with each other than one might think. It was found that the principle of the 'giornate', the construction of a painting from islands of colour, *mutatis mutandis* must have also been applied to oil painting – even by Rembrandt! (A 'giornata' or 'day-portion' was a well contoured island of wet plaster added to a wall painting in progress to be filled by the fresco painter with a day's work.)

[h3] Chapter VII. Rembrandt's Brushwork and Illusionism; an Art-Theoretical Approach

a41*Subtitles: The Visible Brushstroke. Traditional Formulae and Experimental Developments. Paint Surface and the Evocation of Space*

[h3] Chapter VIII. Rembrandt's Method of Working in the 'Night Watch' and his Late Paintings

Subtitles: Doerner's 'Glazing Myth'. The Night Watch. The Late Rembrandt. The Local 'Imprimatura'. Elaborating the Flesh Tints

As already suggested, it can sometimes be useful to give a brief account of the genesis of a chapter (in this case of two subsequent chapters). Chapter VII was

written as an article for the catalogue accompanying the Rembrandt exhibition *Rembrandt. The master and his workshop* in 1991/92 (Berlin, Amsterdam, London). The choice of subject was related to the fact that in the first three volumes of *A Corpus of Rem brandt Paintings* we in the Rembrandt Research Project had followed a strictly chronological approach. At that moment we had arrived at 1642, the year of the *Nightwatch*. The crucial years of 1643-1669 thus still had to be covered, including the 'late', essential Rembrandt (c. 1651-1669).

Having spent 18 years writing the volumes dealing with the period 1625-'42, there was some doubt as to whether we would still have the stamina to deal with the late Rembrandt. For this reason I decided to begin with the late Rembrandt in my article by asking the question of the function and meaning of Rembrandts 'rough manner', which is so typical of his way of working between 1651 and 1669.

Initially, this seemed to be a purely stylistic investigation. The question of whether the rational working procedure – described in Chapters II and VI – was maintained by the later Rembrandt had no part of this argument. That question was dealt with in Chapter VIII, written in 1996 especially for the present book. As anticipated, the late Rembrandt turns out to have been much freer and unconventional in the practice of his craft as a painter than during his early years.

During the genesis of Chapter VII devoted to the theme of the visible brushwork and its role in achieving a convincing illusion of reality on a flat surface, it became gradually clear that what is referred to as Rembrandt's 'rough manner' has only partly to do with style. The rendering of surface textures and suggestion of space, achieved by the manipulation of the consistency of the paint, probably plays a more significant role; and so does the role that Rembrandt allowed to chance during the 'rough' working up of the paint.[12] In this context, certain ideas on human perception that I believe can be ascribed to Rembrandt are also highly significant (see p. 179-190).

Since the appearance of the first edition of this book I have carried out further investigations in several of the areas sketched above. Rembrandt's earliest use of the 'rough manner' (in the *Laughing soldier* in the Mauritshuis), for example, could be related to the three 'genera dicendi', the three styles as used by Virgil, which was so admired in the educated circles of art-lovers around Rembrandt.[13]

The intriguing transition from the early to the late Rembrandt, however, called for a more far-reaching explanation. This transition was perhaps not to be understood as the result of stylistic or other above-mentioned factors. The question that may have played an essential role in this transition is discussed in my essay of 2006, titled 'Rembrandt as a searching artist'.[14] I believe that the most likely explanation for the great difference between the early and the later Rembrandt is to be found in the fact that the early Rembrandt (up to the *Nightwatch*) preferred to represent his figures in life-like movement. However, he began to understand that these efforts were futile because his figures would always remain 'frozen' in the static nature of the painting, and thus the older Rembrandt (after what seems to have been an artistic crisis between 1643 and 1651) changed his strategy and from then on depicted his figures at rest as a rule. The lively and visible brushwork may have been introduced to create the desired dynamic in another way.[15] This explanation for a change that we had always tended to assume was a change in 'style' may seem simplistic; but seen in the context of the dominant thinking of his time, in terms of 'progress' in the creation of

painterly illusions, the change of approach must have seemed to Rembrandt a significant advance.

It was only toward the end of the seventeenth century, after Rembrandt's death and in the context of the 'quarrel between the ancients and the moderns', that it was realized that in art, unlike in science and technology, there was no real progress.[16]

That both the early and late Rembrandt must have thought in terms of progress, is perhaps corroborated by the following interpretation of the wonderfully convincing presence of Rembrandt's face in the famous *Self-portrait* in Kenwood House (fig. 266). At first sight, one would say the rough manner – as a style – has been applied here. However, if one pays attention to the extraordinary credibility with which Rembrandt has rendered his skin, in an apparently nonchalant fashion, it is insufficient to attribute this to, say, the right choice of colours used. I suspect that the countless impressions of the brush hairs in the wet paint during the painting may have been deliberately intended by Rembrandt to depict the pores. According to Ann-Sophie Lehmann, specialist in a48the field of the depiction of human skin, whom I consulted not without embarrasment, this is not such a fanciful idea. Painters had been engaged with the problem of representing the pores of the human face since the sixteenth century. Among others, Vasari wrote about it, as did Rembrandt's pupil, Samuel van Hoogstraten.[17] Once alerted to this option, the eye registers that when the late Rembrandt rendered a male face, the brushwork differed accordingly from that in a female face (compare Bredius 326 and 401).

In the case of the Kenwood *Self-portrait*, it is evident that what seems to have been done with coarse touches has actually created a surprisingly subtle effect. What is so miraculous about Rembrandt's late 'style', is that we are not looking at a pedantically applied 'trick' but at a deliberate and yet casual play with chance. In this way, and certainly not only in this painting, nor only when rendering the human skin, Rembrandt seems to have let the surface of his brushwork converge with reality rather than, as other painters would conceive it, imitating reality in gradations of colour (see p. 156, 185-6, 190).

[h3] Chapter IX. The Search of Rembrandt's Binding Medium (p. 224-243)

Subtitles: Questioning the Painter's Eye. Questioning the Scientists' Results. A New Effort to 'Break the Code'. Additions to Rembrandt's Paint

The idea that Rembrandt was a kind of alchemist when it came to the composition of his paint is one of the oldest and most appealing ideas about his technique (see p. 155-6). The 'secret' of his art was sought in the differentiation of the substance of his paint (as discussed in Chapter VII) and was attributed to the use of a secret binding medium. Whether there really was a secret recipe is about as uncertain as the question of the alleged secret lacquer on Stradivarius's violins.

We were fortunately able to collaborate over several years on this problem with the laboratory of the chemical corporation dsm, a temporary sponsor of the rrp. Unfortunately, however, this turned out to be too short a period. Nevertheless, we were able to achieve interesting results that call for continuation of the research. Some surprising additions to Rembrandt's binding medium were indeed found, though

certainly nothing of a particularly arcane nature: ground glass, water with egg as an emulsifier, an emulsified red dyestuff, possibly mixed with cherry gum.

One of the most surprising discoveries concerned the working properties of lead white pigment prepared according to the 'Old Dutch method'. This pigment differs radically from the present-day lead white in the conspicuous variation in the size of its granules, in contrast to the regular granule size of modern preparations. The specific ease of working of seventeenth century lead white explains a great deal of Rembrandt's surface textures in the lighter passages: the paint flows easily but at the same time it often remains 'standing' just as it left the bristles of the brush.

This aspect of the Old Dutch lead white preparation and the associated rheology has been investigated by our chemist, Karin Groen.[18] After the appearance of the first edition of this book that research was continued by a group led by Leslie Carlyle in a project at the Netherlands Institute for Cultural Heritage (icn).[19]

[h3] Chapter X. The Impact of Time on Rembrandt's Ideas on Colour and Tone (p. 244-263)

Subtitles: The Yellowed Varnish and the Different Aging of Paint. Rembrandt's Intentions with Colour and Tone. The Aging of Pigments. The Darkening of Paint and the Etchings as Touchstones

The relation between colour and tone is one of the most intriguing and at the same time one of the most ignored problems in the reception of old paintings. It is probably for this reason that it causes so much confusion in discussions over the cleaning of paintings.

In the controversies over the issue of cleaning, opposition to the removal of disfiguring varnish layers has tended to rely mainly on the argument that painters from the past habitually covered or partially treated their paintings with a veil of tinted varnish, or a thin glaze, to soften and bind the colours and tones in order to achieve a greater unity. The argument of these critics is that the total cleaning of a painting would harm or even completely remove such layers. There is, however, no mention of this 'glazing' procedure in technical treatises concerning oil-painting dating from before 1850, either as a recommended or common practice.

Essentially, this anti-cleaning argument is based on the belief that painters from the past were mainly aiming at a *tonal* unity in their paintings at the expense of colour. Against this *a priori* belief in the predominance of tonal values in old painting, one has to insist that it is an anachronistic approach, largely based on nineteenth century art theory concerning the role of tonal values (in French aesthetics 'valeurs') in a painting. A striking expression of this principle goes back to Corot, who seems to have been often quoted in nineteenth century studios as having said: 'd'abord le ton et puis la couleur' ('first the tone and then the colour').

When one compares paintings by Corot and his contemporaries with seventeenthcentury paintings that have been veiled by a discoloured varnish, the similarity is indeed striking. The varnish transforms the colours in a painting into tonal values in such a way that one wonders whether the emphasis on tonality by Corot and his a54followers was not, to some extent, influenced by their familiarity with – and

perhaps even inspired by – venerated paintings covered with discoloured varnish. With such paintings, whether by Rembrandt or by other painters from the past, tone does indeed come first and then colour.

In Rembrandt's time, oil paintings were basically painted as composite images (see Chapters II and VI). The convincing rendering of each separate element (for instance, in a portrait these would be the background, the human skin, hair, eyes, lips, the various parts of the costume etc.) betrays a specific technical treatment, each with more or less standard mixtures. This way of working in fact approaches the way we perceive reality in our daily lives when we see a constellation of separate objects, each with its specific material and related optical properties. What binds them in our perception is roughly their 'functional' relation in a given section of the world around us, their perspectival position in space, and their common lighting (see also the remark on 'giornate' above in the summary of Chapter VI). [20]

[h3] Chapter XI. Perspectives on the Quality of Rembrandt's Art (p. 264-281)

Subtitles: Rembrandt, the Famous Painter. Contemporary Praise. The Craftsman and the Artist. Epilogue on Quality.

The book ends with an 'Epilogue on quality', in which I attempt something that is taboo in the art historical community: to speak or write about quality in more than general terms. The judgment of quality is normally considered so subjective a topic that it is avoided in the scholarly literature.

I am convinced, however, that quality can – and, indeed, should – be discussed with precision, and on the basis of this conviction, I have pursued this path since publication of the first edition.

What is usually overlooked is that one aspect of the quality of a painting can be straightforwardly, objectively judged: that is, whether what has been drawn or painted corresponds to the contemporary norms governing the rendering of reality as we know them from sources of the time. This is a question of the countless means that, during and after their training, artists made their own in order to achieve a successful illusion of the world on a flat surface: the suggestion of space, foreshortening, correct anatomy, the consistent drape of textiles and clothing etc., and equally the treatment of light, correct gleams and other light- and colour reflections. Such artistic challenges played a predominant role in daily studio practice. In the art historical literature, however, hardly any attention has been paid to this. Ernst Gombrich once said in an interview that, as far as he was concerned, the study of the history of art has scarcely begun as long as these aspects, so essential for the art of painting, have not yet been systematically raised for discussion.[21]

If one compares Rembrandt's works with copies and free variants produced by his pupils after those works, a vast range of possibilities for assessing differences of quality opens up. Building on these differences, one finds that many subtle criteria of quality can then be developed for further analysis of Rembrandt's works.[22]

The reluctance to bring quality into the discussion of paintings is not only connected with the fact that there is a taboo in art historical circles against writing or speaking

about quality other than in very general terms. Another reason why it doesn't happen, I am convinced, is that for many – including art historians – the means by which an illusion is achieved on a flat surface are not consciously perceived, however strange that may sound. Usually, when an artistic illusion is more or less successful, one simply does not consciously perceive the multiple means by which that success has been achieved. This explains, for example, why the section on p. 169 to 173 in this book has attracted disproportionately more attention among readers than any other; for in that passage such means were elucidated (and illustrated) in some detail in the case of painting the human face (see figs. 214-221).

Gombrich was right: there is still an enormous amount to be done in this field. Insight into these means is also essentially important for the connoisseur's judgments of paintings, as I have demonstrated in 2008 in an article on connoisseurship.[23]

This book is not primarily about painting technique, although it deals extensively with panels, canvases, erasable writing tablets, the different grounds applied to such supports, and the various ways of conceiving, sketching and otherwise laying out compositions. Nor are the methods, the paints and the painterly effects that add up to the final paintings the most important issues.

My essential aim has been to map out the conditions under which the creative mind sought to achieve a convincing image, in a time when painting was seen as the miraculous realization, on a flat surface, of full colour illusions of either a seen or an imagined segment of reality. It was my great good fortune to be able to pursue this enterprise in the case of one of the greatest artists in history. But I hope that this book will contribute to a greater sense of familiarity with the work of many other artists as well.

Amsterdam, July 2008

[h1] I Introduction:Rembrandt – an Alchemist?

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a61

fig. 1 Rembrandt, Self Portrait at the Age of 26, 1632. Panel(oval), 64.4 x 47.6 cm. (Detail.)Glasgow, The Burrell Collection.

a63Rembrandt van Rijn really existed once – there can be no doubt about that. Among the numerous seventeenth-century documents relating to Rembrandt there is one from 1632 that even seems to present him to us in the flesh. It was written following a brief visit by a notary and two witnesses to the house of the art dealer Hendrick Uylenburg where Rembrandt was then residing (fig. 2).

fig. 2 Detail from the map ofAmsterdam by Balthasar Floriszn,1625. The house marked in green is Hendrik Uylenburgh's dwelling and workshop in which Rembrandt lodged and worked during the first years of his Amsterdam period. In 1639 Rembrandt bought the house next door (marked in pink) in which he lived until 1658, the present mueum'Het Rembrandthuis'

Rembrandt was twenty-six years old at the time. The point of the notary's visit was to establish that Rembrandt was still alive, information required in connection with a seventeenth-century form of betting.[1] On his return home, the notary drew up the following document:

Today, the 26th of July, 1632, I, Jacob van Swieten, Public Notary, [...] visited the house of Mr Heijndrick Ulenburch, painter, living on Breestraat, near Antonysluis in this city, and there

asked a certain young girl who came to the door whether Mr Rembrandt Harmens v Rijn, painter, (who had taken lodgings at the house) was at home and available. The same girl replied 'yes' and when on my request the aforementioned Rembrandt Harmens v Rijn, painter, was called and had come to the entrance hall where I was a66 *waiting for him, I asked him if he was Mr Rembrandt Harmens v Rijn, painter, and he having replied 'yes' I then said to him that that was all and that it appeared to me that he was still fresh and vigorous and in good health, to which he replied, 'that is true, I am – thank God – fit and in good health'. Enacted, in all sincerity, at Amsterdam in the presence of Elbert Dirxz and Arent van Southoven, witnesses.'* [2]

After reading Van Swieten's text, one is forcibly reminded of the fact that there are two painted self-portraits – plus several etched and drawn ones – from the same period (frontispiece, figs. 1, 3).[3] These are in fact the only portraits that show us Rembrandt dressed in the type of clothes he must have worn in daily life and in which the notary might have seen him.

fig. 3Rembrandt, *Self-Portrait in a Soft Hat*. Touched etching, 1631-33. The head of this self-portrait is an early state of the etched self-portrait (see fig. 64) finished in black chalk. The inscriptions are peculiarly complicated; this type of signature Rembrandt used in and after 1633. Apparently he antedated the work to 1631, the year in which he must have started the etching. The indications of Rembrandt's age (first 27 then 24) must have become mixed-up in the process of antedating. This is one of three of such touched etchings, all based on the same early state of the etching

a70We would love to follow Rembrandt's steps back into the house once the notary had gone. The painter would have returned to the back part of the house, to the studio where his Amsterdam career as a painter began.[4] There we could have seen him at work. But just as abruptly as his figure is spotlighted by the document just cited he disappears again into the deep obscurity of the past.

Unfortunately, no texts of the same clarity describing Rembrandt at work have come down to us, though there are several indirect statements from witnesses. The confrontation of two of these texts – they both attempt to account for the *pasteuse* method of painting that is so typical of Rembrandt – at once makes it clear that particular caution is required with such sources. After conversations with Rembrandt's pupil Eberhard Keil,[5] Filippo Baldinucci (1625-1696), the Florentine abbot and connoisseur, recorded:

> *that the strong impasto was due to Rembrandt's slow way of painting and his habit of returning to the same passage over and over again, and that consequently the portrait commissions eventually stopped coming in.*[6]

The painter Arnold Houbraken (1660-1719) (fig. 4), who was on intimate terms with several painters who had worked in Rembrandt's studio, gave the following explanation for the same phenomenon:

HOUBRAKENS
Gaet weiden in een beemt van schoone tafereelen.
De Zoon, om 's Vaders roem te hessen hoog in top,
Recht hem een Zegebeeld van duurzaam koper op.
D. van Hoogstraten

fig. 4Jacobus Houbraken, *Portrait of his father Arnold Houbraken,* included in Arnold Houbraken's *Groote Schouburgh der Nederlantsche Konstschilders en Schilderessen (1718-1721)*

> *he had been so busy painting continuously over many years that people had to wait some considerable time for their paintings, in spite of the fact that he continued working dexterously, particularly in his later period when, seen close to, it looked as though the paint had been smeared on with a bricklayer's trowel.*[7]

For Baldinucci, it is the *slowness* of Rembrandt's progress that accounts for his style, whereas for Houbraken it appears to be the *speed* with which he worked.

Rembrandt certainly existed, but we have to exercise caution in reconstructing his image. The vast Rembrandt literature illustrates just how many different images can be constructed from basically identical data; and this is not only true of the biographical Rembrandt and the reconstruction of his oeuvre, it also has long been true for his method of working. The fact that it is now possible, through scientific methods, to understand an individual painting's genesis, combined with the possibilities to study a large part of his painted oeuvre in this way, opens new ways to understand Rembrandt's working habits. Written sources, read in the light of these new insights, add to our knowledge in an often unexpected way.

[h2] Workshop Secrets

a77Over the centuries, Rembrandt's method of working, both as a painter and an etcher, has spoken to the imagination more than that of any other artist, and the idea that he possessed a 'secret' has regularly surfaced. Just as people have sought the 'secret' of Stradivarius in the composition of the varnish used in the finish of his violins, many have looked for Rembrandt's secret as a painter in special ingredients he is thought to have added to his paint to achieve those specific Rembrandtesque effects (see Chapter IX).

It is true that seventeenth-century painters must have had their secrets. When Rembrandt's pupil Samuel van Hoogstraten had completed his book *Inleyding tot de hooge schoole der schilderkonst* (Introduction to the higher education of the art of painting), which was published in 1678, he asked *'one of our celebrated painters, out of friendship'* to read the manuscript. According to Hoogstraten, the painter replied to this request,

> *that he certainly desired to read this work, but that he would not wish to make his views on it known in writing: since in his opinion, he would thus impart to me the secrets of his art, and teach what he owed only to his pupils and disciples.*[8]

We don't know who this painter was. It can hardly have been Rembrandt since he was already dead (Rembrandt died in 1669). But in the light of this quotation it is highly significant that there was a story in circulation, according to which Rembrandt too had his studio secrets and, moreover, that he did not divulge them to his pupils.

It is reported on his etching technique:

> *He also had his own way of elaborating and completing his etching plates: which he never showed his pupils; there is also no way to figure out how he did it; consequently*

this invention (like the science of colouring glass, as invented by Dirk and Wouter Crabeth of Gouda) was carried with its inventor to the grave.

This legend of Rembrandt's studio secrets being '*carried with him to the grave'* is included in the first extensive biography of Rembrandt, written by Arnold Houbraken, the Dordrecht painter already introduced above[9] (see fig. 4). For a long time, Houbraken's text was the main source of information about Rembrandt. No wonder Hou- braken's suggestion that Rembrandt had secrets has contributed to the aura of mystery that has surrounded the question of Rembrandt's technique ever since. Besides, it was an aura of mystery that concerned not only his technique. Rembrandt the person was also regarded as unique. He became thought of as someone with an exceptional talent who displayed this talent, however, in his own wayward fashion: a rebel, an early prototype of the nonconformist, headstrong, self-willed artist. And in spite of efforts by Slive,[10] Emmens[11] and others to explain this characterization as a result of the late seventeenth- and eighteenth-century classicist criticism of Rembrandt's style and choice of subject, the image has stuck. Not so long ago for example, in 1968, the great variation in the results of scientific investigation of the grounds found on Rembrandt's panels and canvases were readily seen in this light by the conservator Richard Buck:

Rembrandt seems indeed to have been a nonconformist quite free from the more rigid technical disciplines followed by the other great masters.[12]

In retrospect, this variation in the composition of the grounds turned out for the most part to be attributable to mistakes in a83the interpretation of the paint samples analysed (see Chapter II, p. 17 ff).

The detailed art-historical research of the last one hundred and fifty years has put a great deal of the myth around Rembrandt into perspective. On the one hand, this is the result of a more thorough analysis of the documents relating to Rembrandt – which are still coming to light – and by placing these documents in a broader context. Consequently it has been found possible to place him more satisfactorily within his own time. Just as importantly, however, the historiography which had developed around the 'case of Rembrandt' has itself been more critically scrutinized, and its axioms and apparatus questioned. It is clear that the romantic image of the artist, and especially the cult of the solitary and misunderstood genius, played a considerable role in the creation of Rembrandt's image. This is demonstrated, for example, by such texts as the following written by the French painter and great connoisseur of Dutch art Eugène Fromentin (1820-1876) (fig. 5) apropos of Rembrandt's technique:

A. Gilbert

fig. 5A. Gilbert, *Portrait of Eugène Fromentin.*

> *As to his technique, Rembrandt painted, sketched and etched like no one else. His works in themselves were a mystery. People admired him with a certain uneasiness; he was followed [by his contemporaries] without being fully understood. His work was regarded rather as that of an alchemist.*[13]

In our own time, both Rembrandt's person and technique have been largely demythologized. The research set out in this book, of which the second chapter was already published in an earlier version in 1977, is intended as a contribution to this process of demythologization. This is not to suggest, however, that this process should be taken to the point where nothing remains but Rembrandt as an honest craftsman doing his job in a conventional way. Though many of the questions of Rembrandt's use of materials and painting technique can be resolved into the prevalent practices of a seventeenth-century painter's studio, it remains clear that he was an original explorer in the field of painting technique – perhaps not so much in the alchemical sense, though research currently in progress into his use of binding media (which is reported on in Chapter IX) may well show this to be the case as well. Rembrandt's technical investigations which resulted in his breathtaking evolution as a painter seem to have been primarily concerned with exploring the possibilities of painting technique that could be put to use in pursuit of pictorial ends that were undoubtedly unusual in his time (see also Chapter XI).

[h2] The Self-Supporting Studio?

a87In order to obtain a clear image of Rembrandt at work, it is not enough to study his painting technique. One also needs to understand what happened *outside* his studio: the production of the materials he used. The prevailing image of Rembrandt at work has become distorted by what can best be described as the myth of the self-suffiency of the historical artist's studio, the belief that an artist like Rembrandt would make all of the materials he used for his art himself. Jacques Maroger in *The Secret Formulas and Techniques of the Masters* (New York, 1948), has expressed this preconception as follows:

> *... painters had to produce their own raw materials. Over these, they were sometimes obliged to work very hard in order to transform them in usable products for their art. Nearly everything they used was made by their own hands. They prepared their own canvases as well as their colors and sometimes even their brushes.*[14]

Research set down in this book shows that quite a different situation existed in the Netherlands in the seventeenth century – one which certainly also pertained to Rembrandt. Instead of the self-contained and self-supporting studio, the image revealed here is one of lively activity *outside* of the artists' studios devoted to producing and supplying all sorts of products for the immediate use of the artist at work.

It was not the written sources that were primarily responsible for undermining the myth of the self-sufficiency of the artist's studio. Through systematic research into a great number of paintings, patterns were revealed which led to the inevitable conclusion that those painting materials, which could be examined systematically to this end, in particular the panels and canvases on which Rembrandt worked, were acquired ready-made and ready for use.This

conclusion was subsequently corroborated by scattered contemporary texts, as well as by the analysis of seventeenth-century depictions of artists' studios. Such sources are seldom self-explanatory. One is often only alerted to their significance through intimate knowledge of the products of the painter's activity – i.e. the paintings themselves.

The interaction between research into the paintings (and related etchings and drawings) by Rembrandt on the one hand, and contemporary written and pictorial documents on the other hand, characterizes the method used in this book. At first sight, many texts and other sources do not appear to show an immediate connection with Rembrandt. For this reason they have frequently been overlooked. As it turned out, however, they can clarify unknown details of Rembrandt's activity. This involves not only details of workmanship; just as important, if not more important, is the fact that hitherto unused documents can clarify Rembrandt's way of thinking about certain artistic matters.

The analysis of such documents – with the emphasis on texts by one of Rembrandt's former pupils, Samuel van Hoogstraten (see fig. 244), the writer of the book on the art of painting mentioned above – have received a fair amount of attention in this book.

The scope of the present book is limited to Rembrandt's *individual* activities as an artist. Much could be said – and has already been said – about Rembrandt as a teacher and as the head of a large workshop. These issues have been dealt with elsewhere,[15] as a90Rembrandt as a draftsman and etcher will likewise be dealt with only in passing.

My main theme is Rembrandt the *painter* at work; the painter as an individual who certainly must *not* have felt himself to be part of a collective body of painters in his workshop, as some have suggested.[16] I hope the reader will experience the same excitement I felt while developing the ideas set down in the following chapters, namely, that Rembrandt was a unique adventurer in artistic matters, one however, whose activity was also much deeper rooted than we thought in the traditional craftsmanship and who was deeply involved in the prevalent discussions on art.

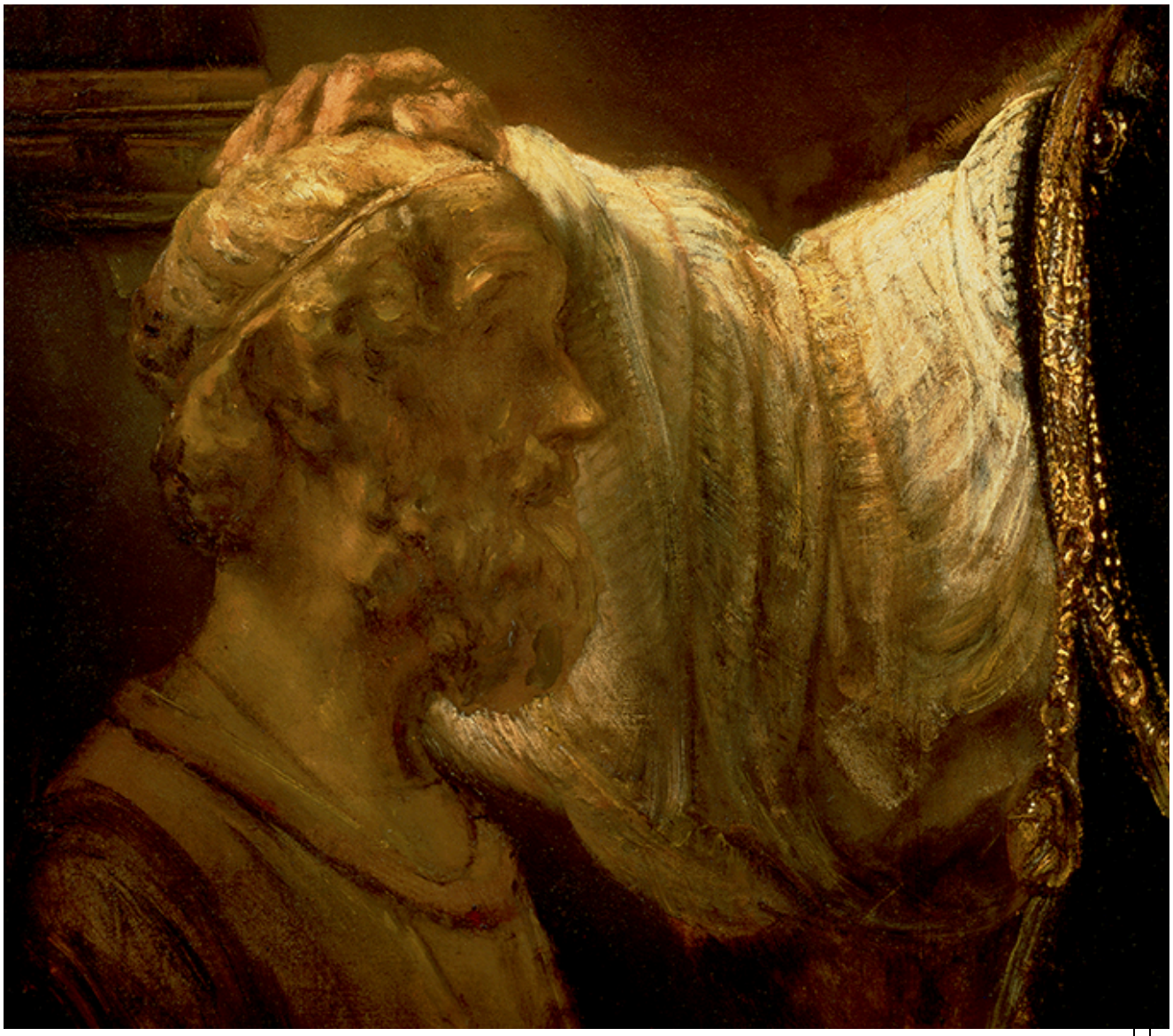

fig. 5aRembrandt, *Aristotle with the bust of Homer* (detail), 1653. Canvas, 141.8 x 134.4 cm. New York, The Metropolitan Museum of Art

[h1] II Painting Materials and Working Methods of the Young Rembrandt

DOI: 10.4324/9781003702764-2
a94

fig. 6Detail of a history painting of which the subject has not yetbeen identified satisfactorily, one of Rembrandt's first works painted in Leiden in 1626 (see fig. 37). The X-rayof this painting (see figs. 37, 38) shows that the inclusion of Rembrandt's self-portrait in this scene (behind he central figure's sceptre) must have been an afterthought. The details of this ambitious composition on panel show the great variety of pictorial effects Rembrandt used in his early years to render the different fabrics.

[h2] The Support

a97Apart from a few small paintings done on copper,[1] and some on paper,[2] all the paintings we know of done by the early Rembrandt are on oak panels. His first known painting on canvas dates from 1631. In a remarkably large proportion of these early panels the surface of the back is still intact (figs. 7, 8), and not planed down by later hands and covered with a cradling system, as happened with so many of his later panels (fig. 10). Rembrandt's panels vary slightly in their composition. Most consist of a single piece of wood; some have two and others have three parts, invariably with butt-joints, i.e. joints by which the edges of the boards are glued against each other without devices like dowels or tongue and greeve, as was done earlier. The grain of the wood as a rule runs parallel to the length of the panel. The correlation between the number of parts and the format is not a regular one, although the smallest panels are always in one single piece while the largest usually consist of three.

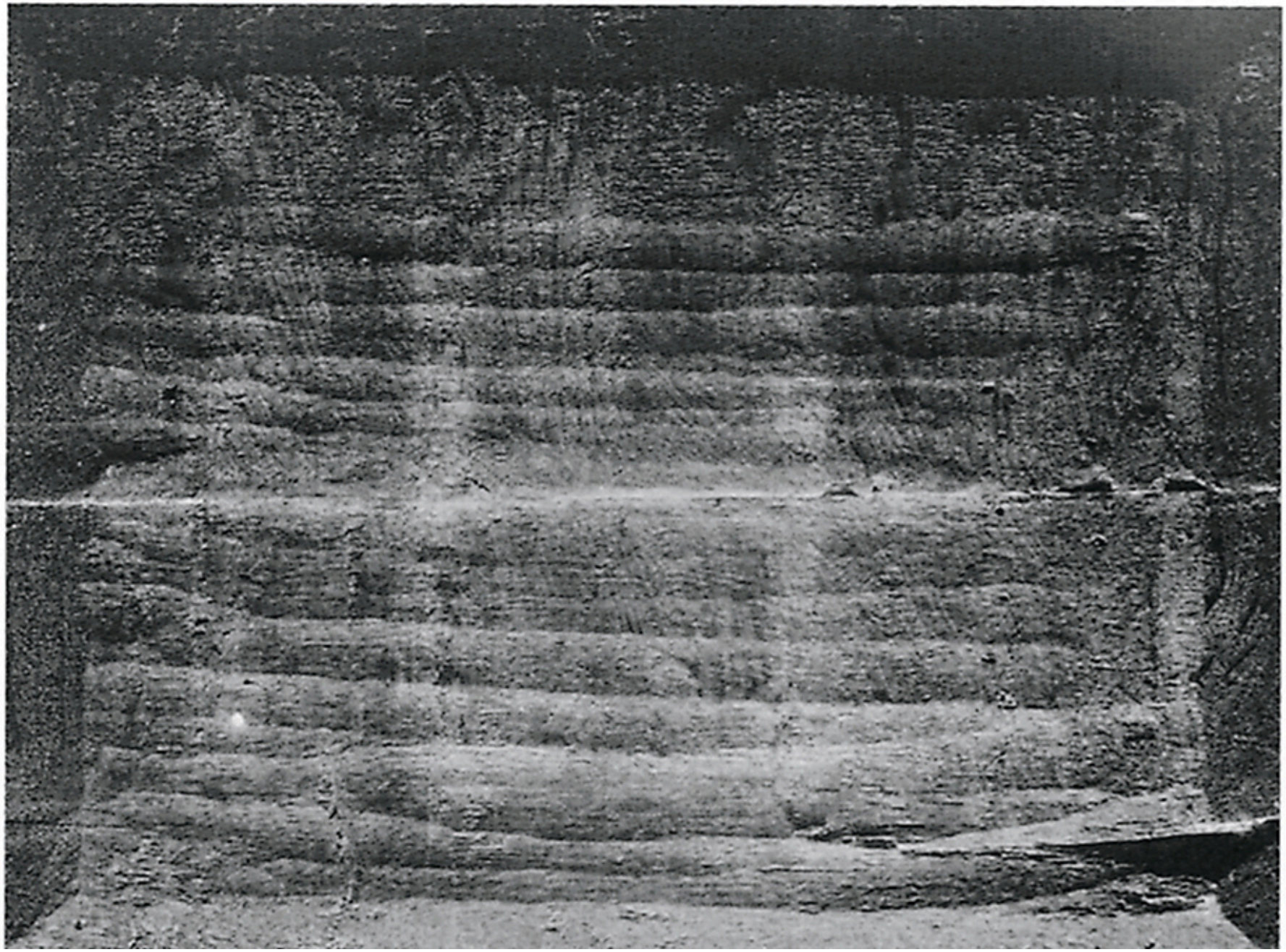

fig. 7The back of an oak panel used by Rembrandt (see for the picture painted on the front, fig. 11). The panel consists of two boards. The two lighter, horizontal marks stem from battens which at one time kept the boards together after the joint had split (see also fig. 30). This panel belongs to a group of panels with the same size and construction, all painted in 1626 and apparently bought at the same time (see for two other panels of this group figs. 16 and 40).

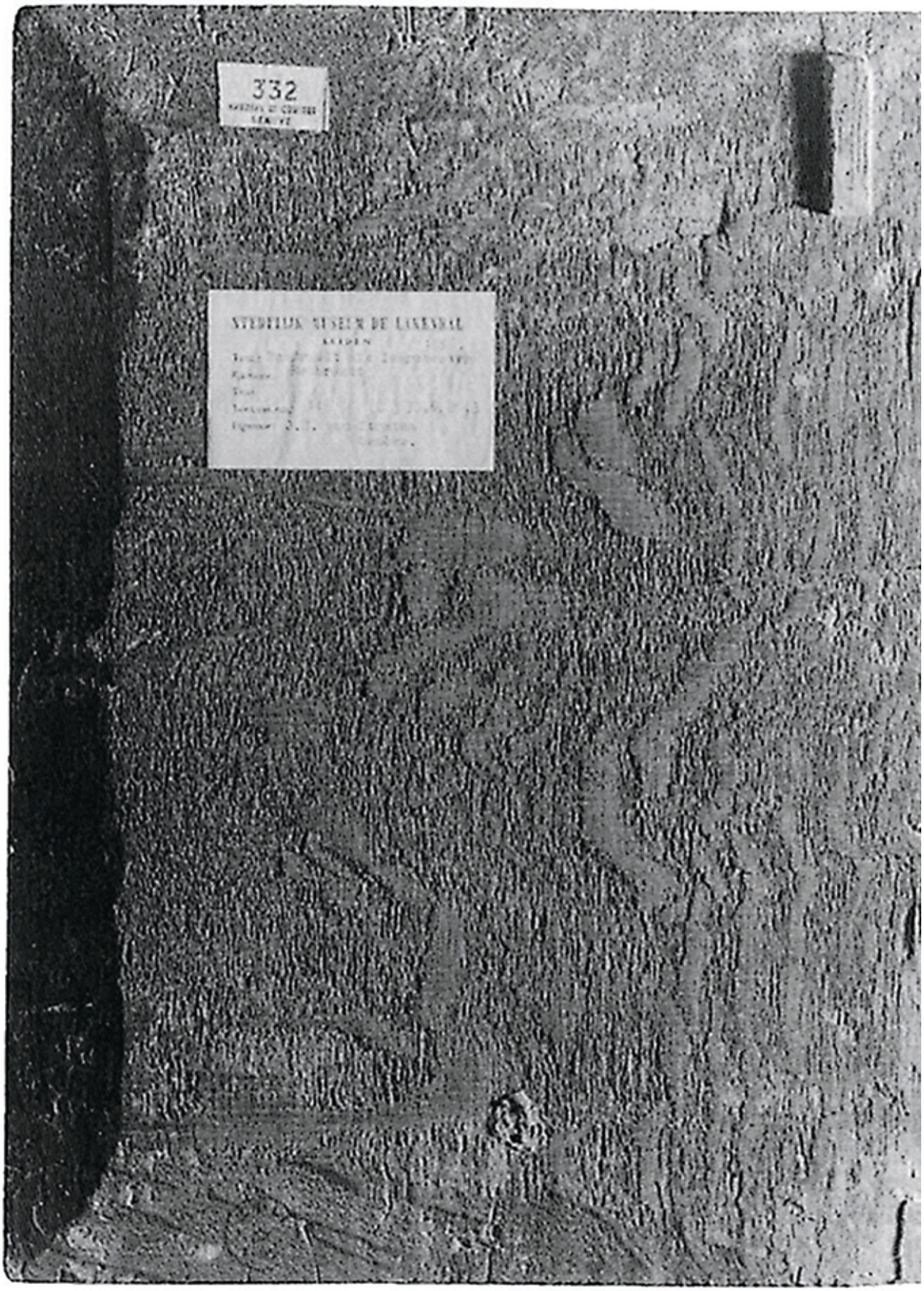
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fig. 8This panel of Br. 132 (40 x 29.4 cm) is bevelled on only three sides, due to its wedge shape.

fig. 9Panel of the type shown in fig. 8, seen from the top. The wedge shape is the result of the panel having been cut radially from the tree trunk.

The majority of the panels are bevelled down at the back along all four sides to a thickness of a few millimetres at the edges, probably in order to allow the panel to be fixed into the shallow rabbet of a frame later. Practically all seventeenth-century Dutch panels correspond to this description. Where panels have been reduced in size since they were made, some or all of the bevelling has disappeared. However, not all panels that are still complete show bevelling on four sides – quite often it is seen on only three, especially in the case of single-board panels (fig. 8). This is the result of the way in a103which the planks were sawn from the treetrunk, i.e. radially (at right angles to the annual rings), the reason being that a plank sawn like this has less tendency to warp. This way of sawing-up a log produces what is basically a wedge-shaped board, and this wedge shape is often still visible to some extent (fig. 9). As the thinnest side of the wedge was sometimes only a few millimetres thick, the panel would in that case not need to be bevelled along that side. For the same reason, the bevelling along the short sides often becomes narrower towards the thin side of the wedge (see figure 8). The thickest part of the panels – including the large-format ones made up of more than one part – usually measures about one centimetre. Protecting such a thin, often quite large panel when it was not in a frame obviously required precautions. Grooved battens were temporarily attached to the edges, as may be seen from the panel standing on an easel in the Boston *Artist in his Studio* (fig. 102). As a result, the surface along the edges is sometimes found not to be covered with paint, wholly or in part (fig. 11). As this phenomenon is sometimes found on all four sides (fig. 11), one wonders if paintings might have been finished after they had already been framed.

Surveying the dimensions of Rembrandt's Leiden panels one notices that they can nearly all be fitted into groups of panels having roughly the same measurements. Paintings produced within Rembrandt's circle, but also panels by others painted during the same period, are often found to fit into these groups, as can be seen from the following list. The dimensions may vary by some centimetres within the various groups.

Clusters of panels from the Leiden period arranged according to standard sizes*

a105

Corp. A1	*The Stoning of St. Stephen* Lyon	123.6 x 89,5 cm	
Br. 460	*History painting* Leiden	121.3 x 90.1 cm	
Br. 538	*Raising of Lazarus* Los Angeles (reduced in height to 96.2 cm)	[100] x 81.5 cm	
Br. 463	*Abduction of Proserpina* Berlin (reduced in height to 84.8 cm)	[100] x 79.7 cm	
Br. 539A	*Judas Repentant* private collection England	102.3 x 79 cm	
Br. 81	*Old Man in Gorget and Cap* Chicago (acc. to information from 1768 height originally about 90 now 83.4 cm)	[90] x 75.6 cm	
Br. 8	*Self-portrait* Boston Gardner Museum	89.5 x 73.7 cm	
Br. 73	*Old Man with Crossed Arms* Boston	74.7 x 59.5 cm	
Br. 601	*St. Paul in Prison* Stuttgart	72.8 x 60.2 cm	
Br. 423	*Two Old Men Disputing* Melbourne	72.3 x 59.5 cm	
Br. 12	*Self-Portrait* Liverpool	69.7 x 57 cm	
Corp. A5	*Baptism of the Eunuch* Utrecht	63.5 x 48 cm	
Br. 632	*Musical Allegory* Amsterdam	63.4 x 47.6 cm	
Br. 487	*Balaam* Paris Musée Cognacq-Jay	63.2 x 46.5 cm	
Br. 490	*David Playing the Harp to Saul* Frankfurt	61.8 x 50.2 cm	
Br. 489	*Samson and Delilah* Berlin	61.3 x 50.1 cm	
Br. 70	*Old Woman* Windsor Castle	61 x 47.4 cm	
Br. 543	*Simeon in the Temple* The Hague	60.9 x 47.8 cm	
Br. 430	*Christian Scholar* Stockholm	60.8 x 47.3 cm	
Br. 466	*Minerva* Berlin	60.5 x 49 cm	
Br. 69	*Old Woman Reading* Amsterdam	59.8 x 47.7 cm	
Br. 428	*Old Man Asleep* Turin	51.9 x 40.8 cm	
Br. 3	*Self-Portrait* Japan MOA Museum	49.7 x 37.3 cm	
Br. 602	*St. Paul* Nuremberg	47.2 x 38.6 cm	
Br. 532	*Driving out of the Moneychangers* Moscow	43.1 x 32 cm	
Br. 420	*Rich Man* Berlin	42.5 x 31.9 cm	
Br. 486	*Tobit and Anna* Amsterdam	40.1 x 29.9 cm	
Br. 132	*Man in Gorget and Cap* private collection	40 x 29.4 cm	
Br. 488	*David before Saul* Basle (reduced at bottom long side to height of 27.2 cm)	39.6 x [30] cm	
Br. 149	*The Artist in his Studio* Boston	31.9 x 25.1 cm	
Br. 422	*Foot Operation* Switzerland private collection	31.8 x 24.4 cm	
Br. 633	*Old Man* Milwaukee coll. A. Bader	24 x 20.3 cm	
Corp. A14	*Self-Portrait* Amsterdam	22.5 x 18.6 cm	
Br. 636	*Man in Cap* U.S.A. private collection	22.4 x 16.5 cm	
Br. 76	*Old Man in a Fur Cap* Innsbruck	22.2 x 17.7 cm	
Br. 421	*Three Singers* private collection	21.6 x 17.8 cm	
Br. 421A	*The Operation* private collection	21.5 x 17.7 cm	
Corp. B3	*The Spectacles-Pedlar* Guernsey, coll. D.H. Cevat	21 x 17.8 cm	
Br. 425	*Man Writing by Candlelight* Milwaukee, coll. A. Bader (copper; according to information from *c.* 1790, height originally 15.7, now 13.9 cm)	[15.7] x 13.9 cm	
Br. 2	*Self-Portrait* Munich	15.5 x 12.7 cm	
Br. 63	*Old Woman at Prayer* Salzburg	15.5 x 12.2 cm	
Br. 134	*Man Laughing* The Hague	15.4 x 12.2 cm	
Br. 11	*Self-Portrait* Stockholm (the last three paintings are on guilded copper)	15 x 12.2 cm	

The small variations within the standard sizes could be dealt with by adapting the width of the rabbet of the frame or by inserting strips of wood.

a107At first, conditioned by the attempts seen in the art-history field to reconstruct altarpieces and to reunite pairs of pendants, one tries to explain this uniformity by assuming a particular functional or iconographical relationship between the paintings in a given format-group. The fact that in certain cases the panels are identical not only in their format but in their composition as well (in respect of the number and width of the component members) encourages such attempts at reconstruction with Rembrandt's works. Yet there are rarely convincing arguments for such an iconographic or functional relationship; it is far more likely that these are standard-sized panels that were commercially available. The brief digression

into aspects of the manufacture and selling of panels that follows is mainly intended to elucidate how constrained Rembrandt was in this respect.

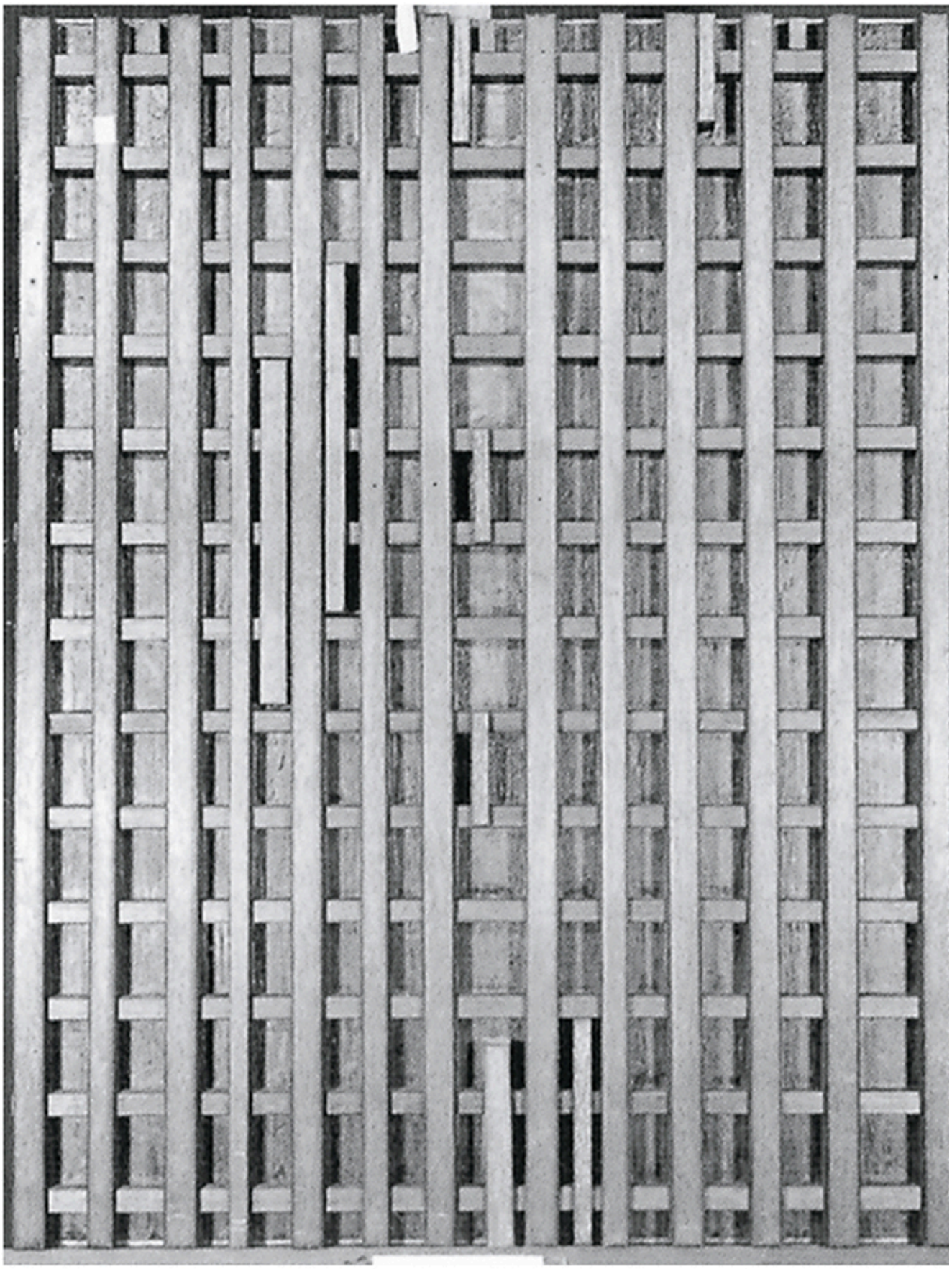


fig. 10Panel with a cradling system on the back (Br. 145).

A painter did not make his own panels. Manufacturing panels was a craft that can be shown to have been a prerogative of the joiners' and cabinetmakers' guild. This was obviously so self-evident that it was not stated explicitly in the charter of the guild in Leiden. At precisely the time that Rembrandt was working in Leiden, however, the joiners' and cabinetmakers' guild felt itself forced, in 1627, to lodge a request with the Leiden authorities for its charter to be extended to include this right. At that time one Jan Pietersz. van den Bosch, a woodturner by trade, who was not a member of the guild, had become active in the making and selling of panels; the guild obviously needed the regulations changed to prevent him from doing so.[3]

Most probably there were as yet no middlemen in Leiden at this time to conduct the trade between the producers and users of panels. This is evident from a petition to the Leiden authorities by Leender HendricxVolmarijn of Rotterdam in 1643, to be allowed to open a shop in the town to a110 sell paintings and artist's materials.[4] In listing what he sought to retail, he included panels. In the document setting out his request (which was in fact granted), he stated explicitly that no such shop existed in Leiden. In previous years he had indeed attended the open-air annual fairs selling his goods, but in that connection he mentions only the sale of paintings. In all probability, therefore, Rembrandt must have bought his panels direct from the joiner. This could mean that he had them made 'to measure', to his own specifications, but this is not likely. From a variety of sources one learns that there was a wide choice of standard sizes, most of them known by the names of various coins – *daalder* size, 26-*stuiver* size, 4-shilling size, guilder size, 12-*stuiver* panel, 10-*stuiver* size and so on. Other standard formats bore a variety of names such as 'large kind', 'little pieces', 'whole and half salvadors', 'portrait panels' ('*groote soort, cleyne stuckgens, heel en halve salvadors, conterfeyt panelen*'), etc.[5]

fig. 11Edges of panels are frequently wholly or partly left uncovered with paint, or only show traces of earlier stages of the painting. This may be the consequence of the thin edges of the panel (see figs. 7-9), being protected by grooved battens (see fig. 102) or a frame.

The first assumption that these refer to measurements of area, with the length and width variable, is based on the presence of variants such as 'narrow guilder size' and 'guilder size longer'. But these must be exceptions that prove the rule. There are indications that the size-names should be looked on as standard sizes with more or less fixed length and width dimensions. The most important piece of evidence for this – meaning that Rembrandt too would have been restricted to using standard sizes – is that the framers produced frames based on the same sizes (fig. 12). A document of 1637,[6] for example, mentions *'Two guilder-size frames without panel; two 8-st[uiver] size frames'*, while in 1646[7] we read *'ebony frames: 4 twenty-six size, 4 guilder size'*, etc. There must therefore have been some degree of standardization in the manufacture of panels on the one hand and frames on the other. The larger standard sizes which one recognizes in Rembrandt's Leiden panels bear a relatively simple relationship to the Rhineland foot.[8] Panels he used that can be placed in the same group quite often show a varying composition of one, two or three boards, indicating that a deliberate attempt had been made to achieve precisely this standard set of dimensions.[9] There is, in short, every reason to believe that Rembrandt kept to standard sizes when buying panels.

fig. 12Frame maker in his studio. Artist and whereabouts unknown.

Because of the remarkable resemblance in both size and composition of certain panels which were evidently manufactured in one and the same 'series',[10] it is probable that Rembrandt bought several panels at a time. This supposition is further borne out by the appearance of whole lots of identical panels in some painters' inventories;[11] the a121 dendrochronological discovery that in a number of cases two or more panels used by Rembrandt came from the same treetrunk is evidence for the correctness of this assumption.[12]

fig. 13Rembrandt, *Old Man with Gorget and Cap*, c. 1631. Panel, 83.4 x 75.6 cm, The Art Institute, Chicago. The dotted line indicates the original size of the panel.

Knowledge of standard sizes may be useful when a panel was cut down by later hands. This happened frequently, for instance in order to fit a painting in a symmetrically arranged picture gallery. In the case of Rembrandt's *Old Man with Gorget and Cap* (fig. 13), the format, tending to a square, raises the suspicion that the panel might have been reduced in size. Because the panel was planed down and cradled (see fig. 10), the toolmarks and bevelling on the back are lost and therefore cannot provide us with any information. As to the width, the panel fits into the category of c. 90 x 75 cm, which Bruyn identified as the 'guilder size'.[13] Given the present height of the Chicago panel, 83.4 cm, one might suppose that a strip of about 7 cm is missing. A sales catalogue from 1767 confirms that the painting originally measured c. 90 cm in height, and therefore must have been cut down after that date.[14]

For a long time it was thought that the oak panels on which seventeenth-century painters used to work were made from trees that had grown in the Netherlands. Since 1987 dendrochronological research has shown that the oak used in Holland was mostly imported from the Baltic area.[15] Correspondingly, almost all oak panels which Rembrandt used are of Baltic origin. In his Amsterdam period, Rembrandt uses panels of other types of wood besides oak wood. Around 1640, he frequently paints on poplar panels (see fig. 109). In the same period, he also uses mahogany and other types of tropical wood.[16] These panels sometimes show traces of carpentry that do not occur in oak and poplar panels. There are deep holes in the sides of one panel, milled edges, sometimes even remnants of metal fittings (fig. 14). H. Olbrich, Director of the Sugar Museum in Berlin, and Peter Klein have shown that the mahogany boards on which Rembrandt painted had been used previously for the boxes in which the costly sugarloaves were imported from Middle America.[17]

A JEWISH RABBI.
Born 1606. REMBRANDT.

fig. 14Back of Rembrandt (attr.), *Rabbi*, 1635. London, Hampton Court (Br. 207). This panel is made of mahogany from Middle America. It shows traces of earlier use, possibly as part of a sugar box.

a130 It was probably not unusual that sitters for portraits brought their own supports.[18] This may explain why supports for portraits are sometimes made of unusual kinds of wood. The portraits of one married couple, for instance, were painted on walnut panels.[19]

On rare occasions Rembrandt painted on paper. Usually these paintings served as a preparation for other works.[20] In other cases, the planned etchings were not carried out (see figs. 101 and 136). Only in 1631 did Rembrandt start to paint on canvas (see ChapterV).

[h2] The Ground

Panels and canvases had to be prepared in some way before they could be painted on. Such a preparation is usually called the ground. In the most extensive study of the grounds on Rembrandt's panels and canvases up until now – a study in which samples of the ground were taken for analysis from 75 paintings attributed to Rembrandt – Hermann Kühn recognized four main types: chalk, lead white, ochre, and quartz grounds.[21] Surveying Kühn's results, Richard Buck voiced the opinion that *'each painting may have been a technical creation as well as a pictorial one'*.[22] This opinion was inspired particularly by the fact that, according to Kühn's analysis, within each of these four main groups there is seen to be hardly a single ground that has the same composition as one of the others. The grounds found in the Leiden paintings done on panel, which belong to Kühn's first group, show variants such as chalk/glue, chalk/ochre/glue, and chalk/ochre/lead white/glue, while panels with a chalk ground from the early Amsterdam period yielded variants with these ingredients in which there was oil as well.

This does indeed reveal a considerable variety. The question is, however, whether we should draw from this the same conclusion as Buck, i.e. that each painting evidently is a technical creation as well. To start with, the result of chemical analysis can usually not be equated with a painter's recipe – it is at best a list of the ingredients discovered, sometimes with an indication of their quantitative relationships. When formulating one's objective, choosing the place from which to take a sample, deciding one's analytical method and interpreting one's results, one works – consciously or unconsciously – from a preconceived idea of the painting procedure used. It is precisely in investigating the bottom layer, or layers, of the painting that it is crucially important to be aware of what one is looking for and what one can expect to find. One should a137a138a139question whether the objective towards which Kühn's study was directed was the best one for unearthing the facts about Rembrandt's studio practice. What triggered off his investigation was the surprising discovery of quartz in the ground underlying the late *Self-Portrait* now in Stuttgart, which came to light in 1962 and was soon being viewed with doubt (fig. 15).[23] The unexpected presence of quartz in the ground provided one of the possible criteria for authenticity of the painting which still had to be assessed to see what weight it carried. The real question Kühn's study was aiming to answer was thus whether there were other Rembrandt paintings in which quartz was present *in the bottom layer*. Because this was the objective in view, insufficient account may have been taken of the possible presence of the *imprimatura* or *primuersel*, a second coat that plays an important part both technically and optically in the preparation of a panel.[24] In by far the majority of cases Kühn made no cross-sections from the samples so that now it is impossible to study them under the microscope and look for information on the structure of the grounds. In the article setting out the results of his study, Kühn mentions the occurrence of two and in one instance three preparative coats only in a number of

canvases – apart from these he seemed, in particular with the panels, to work on the assumption of a single layer.

fig. 15Doubts expressed about the authenticity of this painting soon after it was bought in 1962 by the Stuttgart 'Gemäldegalerie', triggered its thorough investigation with scientific methods (see note 23).

A technique for applying the ground to panels current in the sixteenth and seventeenth centuries was to first brush the panel with glue size and next to apply a thin coat of a mixture of chalk and glue. The main purpose of this layer was to provide an even surface by filling in cavities in the panel; in the case of an oak panel these would include open grains and any damage that might have been suffered while the panel was being made (figs. 16, 17). Once this chalk-and-glue layer had been smoothed, a thin somewhat translucent coat of oilpaint was applied – what Van Mander calls the *primuersel* (sometimes translated as 'priming', which term should rather be kept to denote the first, chalk-and-glue layer).[25] The principal functions of this layer were to make the ground less absorbent and to give it an appropriate tint.

fig. 16Rembrandt, Musical Allegory, 1626. Panel, 63.4 x 47.6 cm. Amsterdam, Rijksmuseum.

fig. 17X-ray of fig. 16. The two light marks above the right hand of the harp player indicate fillings of damage in the front of the panel caused by splinters torn from the wood during planing of the surface. Rembrandt may not have been aware of these faults. The repairs must have been carried out by the panelmaker or primerThe X-ray also shows the underpainting of the sleeve of the viola da gamba player. This can be considered as an indication that light paint was used in the dead colour stage (see page 31). The dark area along the leg of the young woman suggests that originally the reserve for this figure at this place had been larger. Rembrandt must have moved the contour of the leg to the right and subsequently filled in the strip with paint of the colour of the viola da gamba (see page 41).

Obviously, when taking and examining samples of the ground the difference between the two layers just described must be kept in mind clearly; in practice this is not easy, however, because the *primuersel* usually is very thin indeed and because of the absorbency of the chalk-and-glue layer the boundary between the two layers is not always clearcut. This may provide the explanation for the wide variety seen in Kühn's results. The chalk-and-glue layer and the *primuersel* a146taken together do indeed contain the full range of ingredients found by Kühn – chalk, glue, oil and pigments such as lead white and ochre or another brownish earth pigment.

One cannot, of course, rule out the possibility of Rembrandt having experimented with grounds; yet on the basis of a great many observations it does not seem likely that Rembrandt experimented with the optical function of the ground on his panels. Where the ground is visible, it always appears to be a light yellowish-brown colour (fig. 18). One might put this down to the presence of yellowed varnish over a presumed white layer, yet even recently-cleaned panels invariably show the same colour of ground. Joyce Plesters suggested that the yellow colour of Rembrandt's grounds on panel could be explained by discolouration of the glue used as a binding medium for a white chalk ground, or by the discolouring effect of the oakwood to which the layer was applied.[26] Examination of paint samples from Rembrandt's paintings on panel has shown that the chalk-and-glue layer is without exception covered with a thin light brown coat of oil-paint (figs. 19, 20).[27] This ground corresponds remarkably well with a contemporary recipe which the court physician of Charles I, De Mayerne took down from the lips of the Amsterdam painter Abraham Latombé:

> *For [a ground on] wood, coat first with the glue abovesaid, and chalk, it being dry then scrape and render it even with the knife, then apply a thin layer of white lead and umber.*[28]

fig. 18Detail of figure 37. In the shaded part along the forehead and nose the yellow-brown ground is partly visible together with the brownish paint with which the dead colourstage had been executed.

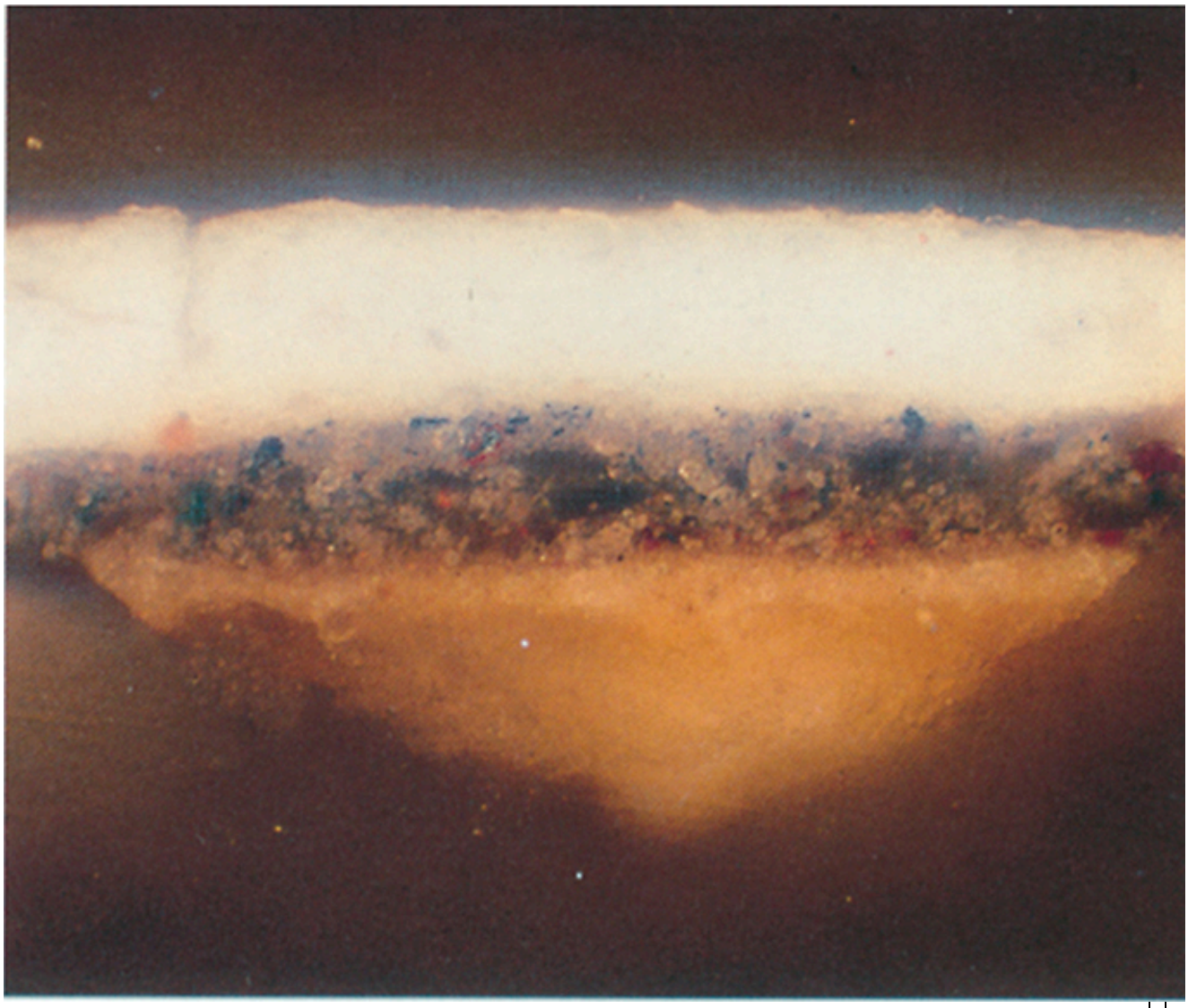


fig. 19Cross-section (335x) from the top part of the white sash of the man on the extreme left in figs. 6 and 37 showing from bottom to top:

1. The chalk and glue priming.
2. A thin layer of yellowish primuersel (containing lead white and some brown pigment in oil) – these two groundlayers show up yellow in the cross-section.
3. A dark mixture used for the underpainting, containing a translucent brown pigment, organic red, lead white and possibly some chalk, black pigment, some blue pigment particles, and some red (either vermilion or red-ochre).
4. A layer of lead white of the sash.The third layer has a complicated mixture. It probably contains a great many different pigments of paint residues from, for instance, the bottom of a container in which the brushes were cleaned, and which were sometimes used at this stage of the work (see p. 24).

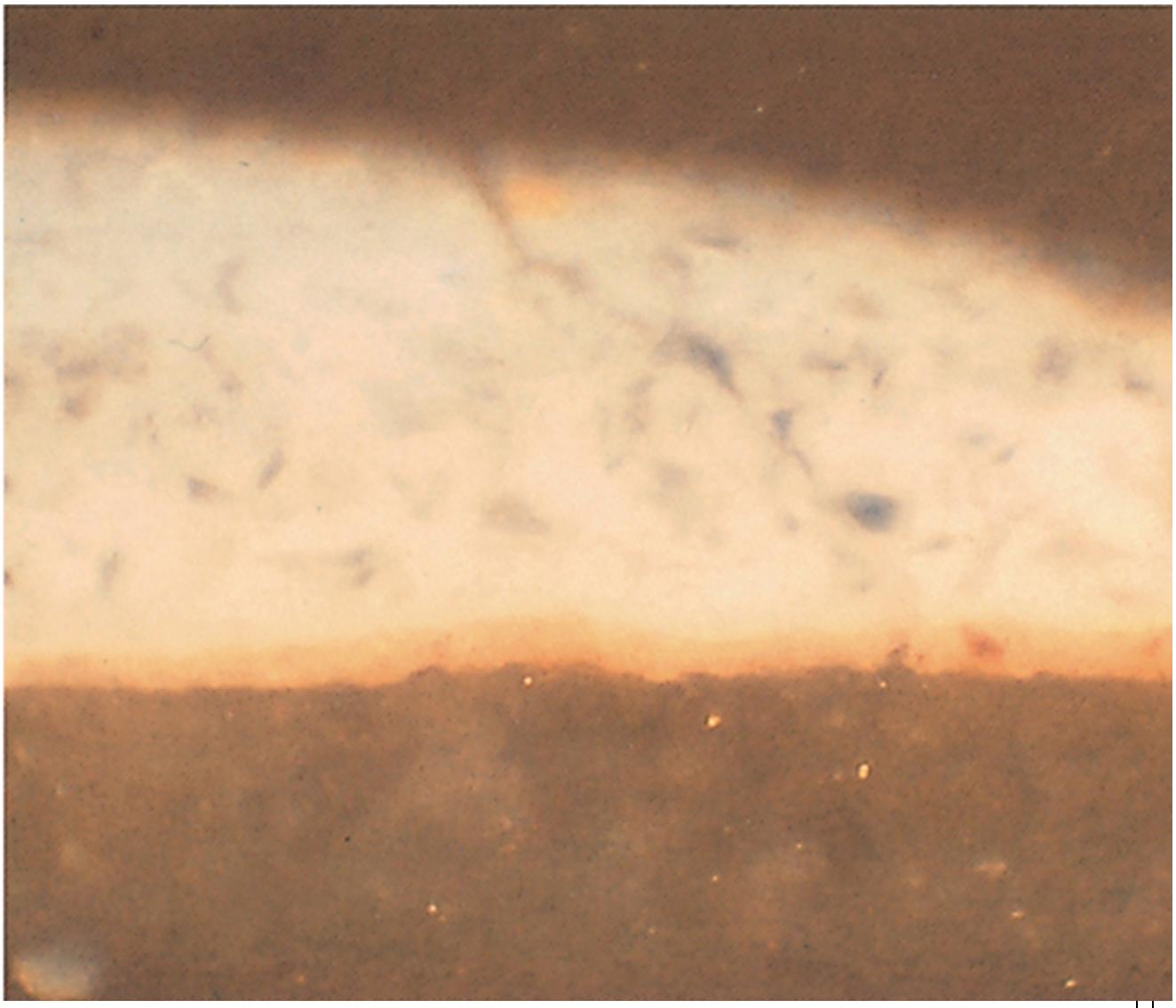


fig. 20Cross-section (390x) from the whiteish sky in fig. 29, showing:

1. The chalk and glue ground (the yellowish-greyish substance in the lower part of the illustration).
2. A thin layer of yellowish *primuersel* (containing white lead and some brown pigment in oil).
3. A layer of lead white, mixed with smalt, to indicate the sky. Smalt is ground blue glass which has a tendency to turn grey.

It seems that the young Rembrandt in Leiden experimented neither with the appearance nor with the composition of his grounds. But even though differences between one painting and another are seen, it is still open to question whether Rembrandt was aware of these differences. In the seventeenth century applying the ground to a support apparently was a job usually done by others outside the studio. In the Leiden municipal archives there is a document showing that in 1676 one Dirck de Lorm a153 was authorized to make primed canvases and panels for painters in the town. He was to take the place of the frame-maker Leen- dert van Es, deceased, who had provided this service for painters up to then. According to de Lorm's petition, the painters had since the death of Leendert van Es been obliged *'to go and buy'* their primed canvases and panels in other towns *'to their great*

trouble and expense'.[29] Apparently, doing one's own priming had disappeared from workshop practice. How long had this been the case? De Mayerne mentions that he had been given a recipe for priming canvas by a Walloon *'imprimeur'* living in London.[30] In the Haarlem guild archives, primers (*primuerders*) are mentioned from 1631 onwards.[31] There is some evidence, then, that preparing canvases and panels was a separate craft, though the possibility that it was undertaken in the studio as well cannot be excluded (see fig. 168). The application of the second ground layer especially, may have been carried out in the workshop by some painters.[32]

The history of coloured grounds and especially the function of such grounds have been only partly examined. There is a fundamental difference between painting on a white ground and on a tinted or coloured ground. While on a white ground all tonal shades have to be applied deliberately, a tinted ground acts as a middle tone by itself. It opens up the possibility to select the position and the intensity of the highlights with great precision (see fig. 26). With a white ground, every unsufficiently covered part of the ground would function as a highlight, while with a tinted ground it can remain partly uncovered without the tonal cohesion of the painting being distorted. It is because of this function of the ground as a 'safety net' that working with a tinted ground was self-evident in the Baroque a158period when the organisation of light and shadow had a vital function in a painting's composition. No wonder Rembrandt exploited the possibilities of tinted grounds to the full (see also Chapter 8).

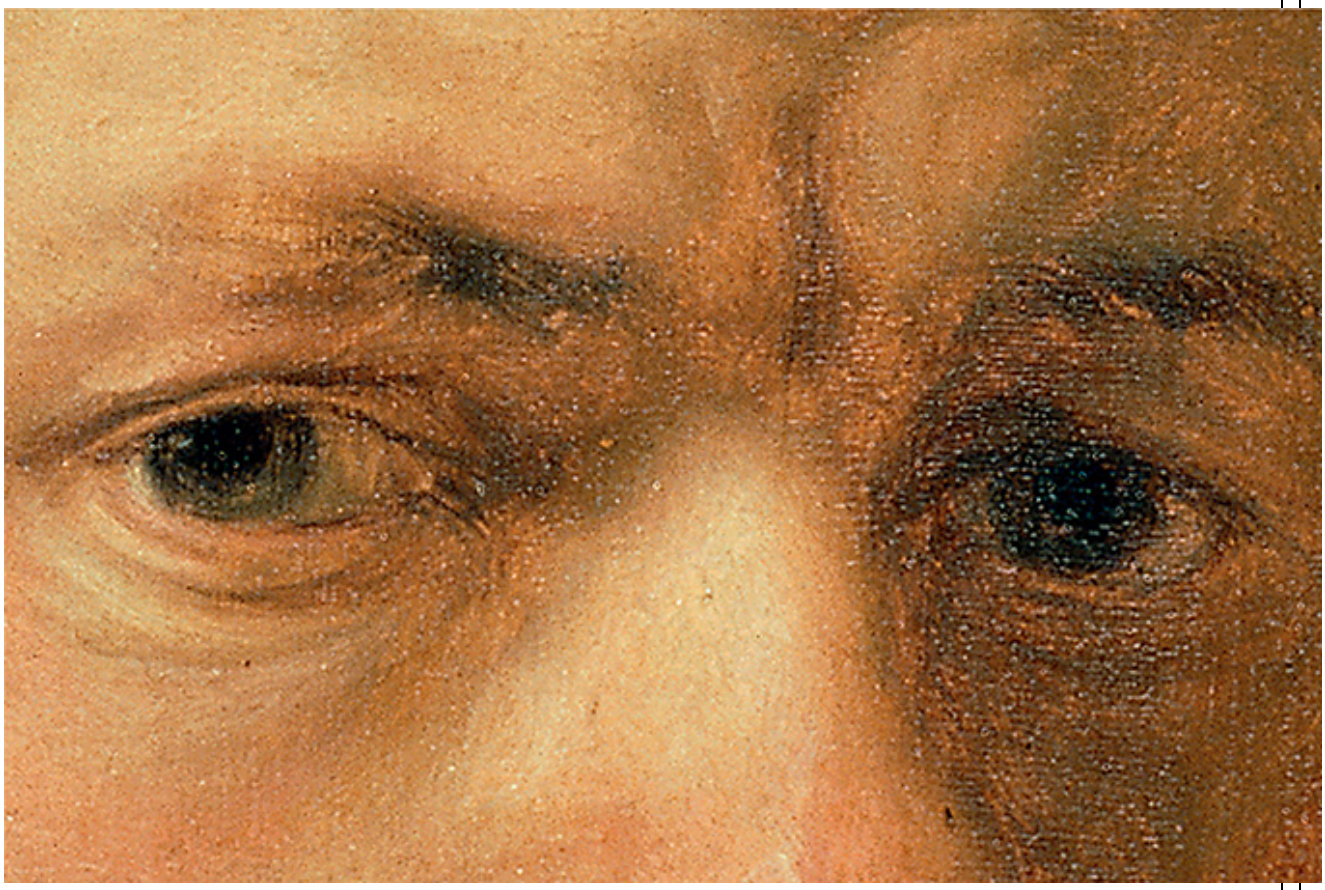


fig. 21Rembrandt, *Self-Portrait*, 1633. Panel, 60 x 47 cm (oval). Paris, Louvre. Detail showing the brownish underpainting in shadow parts left uncovered during the completion of the work.

[h2] The First Sketch, the Monochrome Underpainting and the First Lay-in of Colour

'Nothing is known either from sources or examination about any kind of underdrawing which Rembrandt could have done on these coloured primings'. This was one of Von Sonnenburg's conclusions in his 1969 survey of existing knowledge of the technical aspects of Rembrandt's paintings.[33] No trace has been found in Rembrandt's early panels of an underdrawing in black chalk [34] as can be seen not only in Rubens' paintings on panels with a light ground, but also in at least one by Rembrandt's teacher Pieter Lastman.[35]

The restorer Johannes Hell suggested that as a rule Rembrandt would have done his first lay-in with a brush, using brown paint of greater or lesser translucency, not only to draw lines but also to apply a tone over largish areas (in the way a wash drawing is done).[36] In many of Rembrandt's paintings on panel from 1630 onwards one does indeed encounter in places a more or less translucent brown, red-brown or greybrown paint, brushed on quickly, as it seems directly on the yellowish ground. This occurs, for example, in the shadow and hair areas of portraits and the skies and foregrounds of landscapes (figs. 21, 22). One's first inclination is to look on such areas as having been deliberately done in this way; a165it might be better to say that they have deliberately been left visible in order to avoid mixing half-tones with white whenever possible.[37]

fig. 22Rembrandt, *The Stone Bridge*, circa 1640. Panel, 29.5 x 42.5 cm. Amsterdam, Rijksmuseum. In the dark parts of the sky and the foreground the translucent underpaint has been left partly uncovered to fulfil its tonal function in the painting. If such parts, like those that can be seen in fig. 21, were to be painted with opaque mixtures, the paint surface would obtain a density and heaviness which would strongly influence the aspect of the painting as a whole, as it does in the early paintings (see figs. 16, 29, 37, 40).

Areas of this kind occur hardly at all in Rembrandt's earliest paintings. On closer inspection, however, one finds a great many small patches that do meet this description but have for the most part not been left like this intentionally. These are often small corners left open in complicated outlines (figs. 23, 24). One meets these bare patches (in which sometimes only the yellow ground is visible) especially at places where more than two areas abut each other. There is consistency in colour, translucency and the generally loose brushwork in what is seen within these patches – only the tone and direction of the brushstrokes vary, and these bear a more or less clear relationship to what is being depicted. The obvious assumption is that this brushwork is part of a monochrome underpainting otherwise hidden from view. As this phenomenon is met in all other paintings on panel by Rembrandt as well, it is clear that one is seeing traces of a standard part of the painting process here.

fig. 23Detail of the book carried by the servant in fig. 29 showing elements of the brown underpainting over the yellowish ground in the corner of the book.

fig. 24Detail of the secretary's book in fig. 37 showing brown underpainting over the yellowish ground; the paint used for the underpainting has shrinkage cracks.

Occasionally this brown paint shows very fine shrinkage cracks, which may point to an (overgenerous) use of oil rather than to a gluey binding medium (fig. 24). In instances where it has been possible to carry out a chemical analysis, the paint has proved to have as its major ingredient an organic brown pigment, possibly Cologne earth or bitumen.[38] The use of such pigments could also account for the shrinkage cracks described.

Cross-sections sometimes show a varying and occasionally quite large number of pigments in the paint used for this monochrome stage in the painting process – yellow and red pigments, earth pigments and lead white are encountered in dark brown layers of paint that for the most part were intended from the start to disappear from view (see fig. 19). It seems improbable that anyone would deliberately make up such a complicated mixture at this stage of the work. Rather, one may assume that Rembrandt was using up the accumulated remains of paint (e.g. from the cleaning of brushes and palettes) wherever possible. This was not a habit peculiar to Rembrandt, but part of existing workshop tradition. Joyce Plesters observed the same phenomenon in paintings by Tintoretto (see note 39).

In the Brussels Manuscript of 1635 the French painter Pierre Le Brun explains the origin of this phenomenon:

The pinceliere is a vase in which the brushes a171*are cleaned with oil, and of the mixture [of oil and dirty colours] is made a grey [colour, useful] for certain purposes,*

such as to lay on the first coats, or to prime the canvas. The pinceliere is a vase containing oil, in which the brushes are placed that they may not dry. [39]

It is likely that Rembrandt sometimes mixed these remains of paint with the abovementioned organic brown pigment that usually predominates in the mixture.

The monochrome sketch discussed here can be equated with what is referred to in seventeenth-century texts as the *'dead colour'*, although, as we shall see below, this term could refer to another kind of underpainting as well.

It is not likely that Rembrandt started straight away with an underpainting in tone; a first setting-out of the shapes using lines would be more natural. In his analysis of the Munich drawing related to the Stockholm *Claudius Civilis*, Müller Hofstede remarked on very thin, rough sketchlines that can be seen under the heavier lines and tones in the Munich drawing. Such thin lines were also found by Schatborn in drawings from Rembrandt's Leiden period; they appear for instance in a pen and wash drawing in Amsterdam (fig. 25) connected with the *Judas Repentant* (see figure 103).[40] Though with a drawing it is difficult to tell with any certainty which lines were drawn first, it is highly probable that these thin lines constitute the very first sketch. In the Amsterdam drawing they have been touched up with white body colour in some places by, one may assume, Rembrandt himself, an indication that these thin lines belonged to an initial, rough and partly discarded sketch version. In discussing the art of drawing, Rembrandt's pupil Samuel van Hoogstraten stresses the importantance of keeping the initial sketch very rough:

fig. 25Rembrandt, Study in pen and wash, presumably done in preparation of a major change in the *Judas Repentant*, see figs. 103, 105. Rijksprentenkabinet, Amsterdam. The

drawing was first laid out with thin sketchlines which were partly covered with white paint after the drawing was finished. The white paint has been locally abraided.

> *First, draft what you intend in its broad sweep, on your paper [and] where rough sketching is concerned this is the first principle of drawing well, and of such great importance that if the main bulk is shown fully, well and intelligently one often achieves more with this than can be obtained with much labour afterwards.*[41]

One may conclude from this that in drawing the emphasis was very much on a176a177the first rough sketch. This may justify the notion that the painting, too, went through a stage of this kind, unless one assumes that Rembrandt transferred the lay-out of his composition onto the actual support from designs on paper (as is the case with so many other artists). As will be discussed in Chapter IV, the number of drawings by Rembrandt in preparation of the whole of a composition is, however, remarkably small. There are reasons to assume that Rembrandt did not work out his compositions on paper first, but as a rule sketched them direct on the actual support. He must thus have been in the category of painters of whom Karel van Mander wrote in 1604,

> *that some, well-practised, experienced and working with a firm hand [...] are used to drawing fluently by hand on their panels what they have already seen painted in their mind's eye.*[42]

During the examination of one of Rembrandt's most sketchily executed paintings, the Rotterdam *Concord of the State* (fig. 26), traces of what seemed to be the very first sketch for the composition were found. These were lightly applied lines, dark as well as light ones, which, as appeared after chemical analysis, were bound with a watery medium (fig. 27). It seems that these lines correlate with the very first light sketch-lines mentioned above, as found by Müller-Hofstede and Schatborn in some of Rembrandt's drawings (see above). The tonal dead-colour stage described earlier thus seems to be already a *second* stage in the working procedure.

fig. 26Rembrandt, *The Concord of the State*, c. 1640. Panel 74.6 x 101 cm. Museum Boijmans Van Beu- ningen, Rotterdam. This *grisaille* may have served as a design for an allegorical print which apparently was never executed.

fig. 27Detail of fig 26. Light and dark traces of a sketch carried out in paint with a watery binding medium were found along the contour of the lion's backside.

Research into the painter's terminology has revealed that for the seventeenth-century painter there were three main stages in the production of a painting: 'inventing', the 'dead-colouring' and the 'working-up', followed (according to de Lairesse) by 'retouching'.[43] The dead-colouring stage evidently was in Rembrandt's case not a mere transitional stage, but a provisionally completed whole. Sometimes 'dead-coloured' paintings are listed in inventories. There were, for example, ten such in the 1632 inventory of Rembrandt's Amsterdam teacher Lastman.[44] Hardly a single one of all these dead-coloured paintings has survived. It would not have been uncommon for a seventeenth-century painting, left in a a183a184a185dead-coloured state, to have been 'worked up' subsequently by somebody else.[45] Italian documents suggest that painters had a stock of dead-coloured paintings in their studios which could be shown to potential customers and which were only to be worked up when ordered by a client.[46] Such a practice would account for the large number of ten dead-coloured paintings in Lastman's workshop. It is possible that Rembrandt followed the same procedure. This would explain certain discrepancies in the 'logic' of Rembrandt's stylistic evolution (fig. 27).

Outlining the compositional and tonal organization of a painting in monochrome must have been a very common method. In open places in works by painters other than Rembrandt one regularly finds traces of a monochrome stage. Possibly the term 'dead colour' originally arose in connection with the absence of colour at this stage of the painting.[47] The term was, however, also employed for underpaintings in colour. In an English manuscript, the *Commonplacebook* compiled by Thomas Marshall c. 1640-50, a passage in Dutch linked with

Antony van Dyck describes a method of deadcolouring in which, for each individual area, the final colour is approximated in a flat tint. The passage reads:

> *'Dead-colouring' is called the maniera lavata, that is to say the washed manner; because it fills in the area within the outline with only one colour.*[48]

In an earlier passage in the same manuscript, bearing the title 'dead-colouring' in the margin, it appears that a 'lightly-applied colour' – most probably the 'one colour' of the passage just quoted can be equated with this – was applied over what was termed the 'scheme', in Dutch *stelsel.* The Dutch words *stellen* (= place) and *ordineren* (= arrange) were used to describe the organizing of the composition.[49] According to this passage in the manuscript *'het stellen'* (the 'placing') occurred before the dead-colouring. The full quotation reads:

> *2. Dead-colouring [in the margin].*
> *He should temper his paints well to the needs of the matter, to give the scheme – when it is dry enough [it must therefore be in oil] – a lightly- applied colour.* [50]

Reference is made here to the manuscript from Marshall's *Commonplace-book* because in Rembrandt's early paintings, too, there are sometimes (though only locally) areas that were laid-in with an even colour close to the final one applied over the monochrome underpainting. This seems to have happened for example, in the *Baptism of the Eunuch* (fig. 29). This painting exhibits a quite common phenomenon discussed above, that the uppermost layers of paint stay within 0.5-1 cm from the edges of the panel. On these unpainted edges one can see, apart from the yellowish ground, some brown paint that evidently forms part of the monochrome underpainting. In the case of the *Baptism of the Eunuch*, however, one can also see flat colours, for instance a dark green which must continue beneath the top layers of paint and was quite obviously set down as a preparation for the terrain in the foreground (see fig. 11).

fig. 28Rembrandt, *Samson and Delila*, 1628. Panel, 59.5 x 49.5 cm. Berlin, Gemäldegalerie. There is a discrepancy between the style of the painting, especially in the treatment of the contours of the figure of the Philistine soldier, approaching with the scissors to cut Samson's

hair, and the date, 1628, inscribed on the step behind Delila. The style of the painting rather suggests a date around 1629/30 (see p. 30).

fig. 29Rembrandt, *The Baptism of the Eunuch*, 1626. Panel, 63.5 x 48 cm. Utrecht, Het Catharijne Convent.This painting was discovered in 1975 and could – on the basis of numerous technical details – be ascribed to Rembrandt with great certainty. The head of the Apostle Philipus, who converted and baptised the Ethiopian courtier in the foreground, is heavily damaged by overcleaning.

In the *Musical Allegory* too (see fig. 16), the existence of such a layer can be assumed as a uniform layer of violet, as a preparation for the kaftan worn by the player of the viola da gamba. Examination of the X-ray of this painting (see fig. 17) reveals that there is a rapidly executed underpainting with heightened lights (evidently part of the a194 monochrome underpainting) underneath this even violet layer. This could be taken as evidence that Rembrandt, too, worked – at least in some parts of the paintings – in the way described in Marshall's *Commonplace-book*. This particular working method, however, is encountered only sporadically in Rembrandt's work. In Chapter VIII an intriguing variant of this method in the late Rembrandt will be dealt with.

Given his striving towards chiaroscuro Rembrandt's basis for a painting as a rule indeed must have been a monochrome, tonal version of his composition. The continuation of Van Mander's comment (quoted above) on drawing directly on the support corroborates the idea that the dead-colouring stage was mainly a preliminary stage and that the painter was free to depart from it:

> *These fellow-artists go to it, without taking great pains, working direct with brush and paint, with a free approach, and thus set down their pictures deftly in the dead colour; they 're-deadcolour' too sometimes, soon after, so as to achieve a better composition; thus those who are abundantly inventive go audaciously to work, thereafter making an improvement here and there.*[51]

In those cases where Rembrandt used only brownish tones for the first dead colour the light tint of the prepared support may have been left unpainted in order to serve as the highest light.[52] X-rays and observation of the paint surface show, however, that from as early as 1626 there are paintings where a light paint, containing lead white, was also used in the dead colour (see figs. 16, 17). Such light passages are occasionally visible at the surface of the painting in patches of wear at places where the depiction of a light area at the surface does not wholly correspond with the light-heightened area in the dead colour; the points of the relief of this paint, which is often quite thickly applied, may become visible through wear of the overlying paint. One can see this, for instance, in the *Musical Allegory* (figs. 33, 34). Such areas can be recognized in the X-rays (so long as they have not been covered by areas of surface paint containing lead white) by their very free and fluent handling and a fairly broad definition of form (see fig. 17). It is not certain why – at least for the early Leiden period paintings, always done on light-coloured grounds – light paint occurs a197 in the dead colour of one painting and not of another. It is not unlikely that in Rembrandt's earliest works the use of light paint was a correcting method used when (in the course of what Van Mander calls 're-dead-colouring') a painting had suffered a loss of clarity in the distribution of light and shadow because the ground, where it functioned as the light, had become masked with dark paint. Such corrections can be compared to those Rembrandt made in body colour in some of his drawings (see figs. 25 and 110). Later the use of light heightenings would become an integral part of Rembrandt's method of dead colouring (see Chapter VIII).

fig. 30The detail of the X-ray shows the reserves of the forms in the background in the sky, which was finished first (see p. 3641). The wheel of the carriage was originally designed to be larger than in its present state. The partly visible hind legs and tail of the third horse behind the two other horses were not left in reserve in the sky and may have been an afterthought to clarify the horseman's position. A palm tree was painted over a layer which covers a parasol and an oak tree which were originally painted in the corner to the left (fig. 31). This was one of the clues as to the painting's authenticity. Rembrandt quoted details of a painting by his teacher Pieter Lastman, now in Karlsruhe (fig. 32) and in the part with the tree apparently changed his mind. The horizontal light strip indicates one of the two battens that had been glued to the panel to keep the two boards together after the joint had become undone. The X-ray was taken when the battens were still in their position. Fig. 7 shows the panel after the battens were taken off and the board glued together again.

fig. 31Infrared photograph. Detail (see fig. 29), faintly showing the parasol and some leaves of the tree which were originally quoted from a painting by Lastman (see fig. 32).

fig. 32Pieter Lastman, *The Baptism of the Eunuch*, 1623. Panel, 85 x 115 cm. Karlsruhe, Staatliche Kunsthalle.

fig. 33Detail of fig. 16.

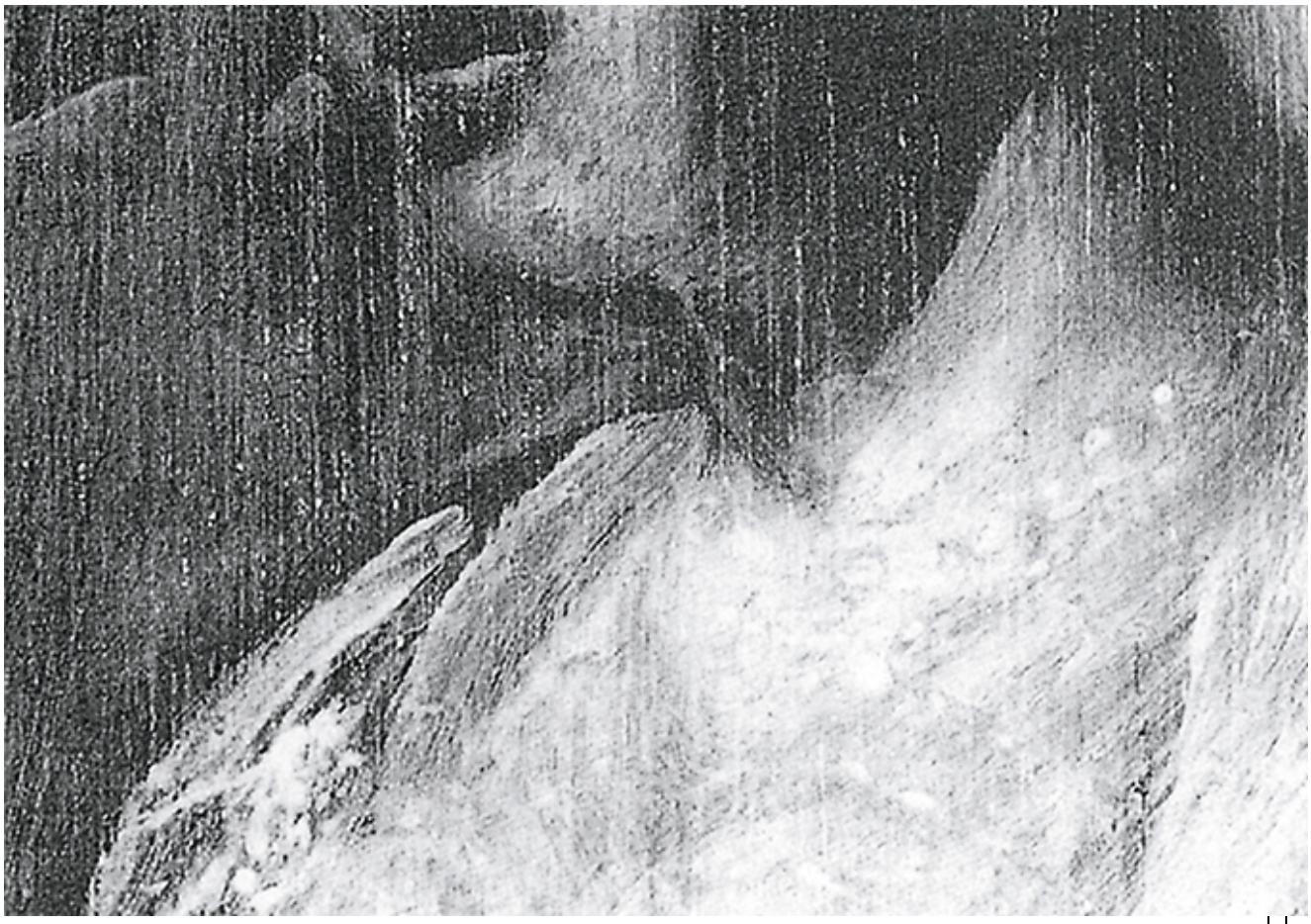


fig. 34X-ray of fig.33. When comparing figs. 33 and 34 the difference between the light underpainting in the woman's neck as seen in the X-ray and the lit area in the final result is clear; traces of the underpainting which have become visible through wear of the paint surface can be seen in the shadow around the present lit area.

[h2] The 'Working-up'

Rembrandt – certainly the young Rem-brandt, but the painter of the *Night Watch* as well (see Chapter VIII) – followed a more or less set working method in superimposing the colour on his monochrome design. This is one of the surprising discoveries concerning Rembrandt's working order. He worked, basically, in planes – from the rear to the front, starting with the sky in out-door scenes or the rear wall in interiors and finishing with the foreground figures. The possibility of such a schematic procedure was so far from obvious that, before the Rembrandt Research Project started, the question of whether there might have been a fixed sequence of operations had not yet been formulated. Only when evidence for it began to pile up during the analysis of observations made on Rembrandt's early paintings was it put forward as a possibility.

The works of Western art which have survived the period prior to 1700 include comparatively few unfinished paintings. In a fair proportion of those that have survived the individual parts appear to have been painted one after the other (see for instance fig. 35), but the idea that in doing so the artist may follow a fixed order has, so far as I know, never

been advanced before.[53] A set procedure was not something peculiar only to Rembrandt, as statements by Gerard de a205 Lairesse, discussed below, will demonstrate.[54]

fig. 35Andrea del Sarto, *Sacrifice of Isaac*, c. late 1520's. Oil and tempera on panel, 166 x 139 cm. Cleveland, Museum of Arts. This unfinished painting demonstrates that the order of working was far less systematic in the sixteenth than in the seventeenth century (see figs. 45, 46, 264).

To our modern minds, it seems more natural to imagine the choice of the spot at which the artist works on his picture to be dictated by the totality of the painting being produced. As Cézanne told his friend Joachim Gasquet, '*Je mène comprenez un peu, toute ma toile à la fois, d'ensemble*' ['You see, I work on my painting as a whole, all at once'].[55] This is the reason why today's painter generally works standing up – so that he can repeatedly walk back a few paces to view the work as a whole. Seventeenth-century painters generally *sat* at their easel.[56] The painter in Rembrandt's *Artist in his Studio* in Boston (see fig. 102) is, it is true, seen *standing* at some distance from his panel, but on the bottom rung of the easel Rembrandt has faithfully recorded the deep grooves worn by the sliding feet of someone sitting often and for long periods on a chair placed in front of the easel. The meaning of the Boston painting will be discussed in Chapter IV (see also Chapter VI).

In the first two stages of the painting process, the 'inventing' and the 'dead-colouring' discussed above, the main concern was with composition, shape and the relationship between light and dark, taken as a whole. During the 'working-up' the main concern was to give everything its correct colouring and to render materials appropriately, and to fix the final contours of the forms. As we shall see, there were artistic as well as practical reasons for doing things in a set order.

How can one reconstruct the sequence followed in 'working-up' the painting? The most obvious way is to examine the contours and look for evidence of overlapping. In work by the young Rembrandt the various components (the clothing and flesh areas, objects, background, floor area and so on) were usually not painted wet-in-wet one with another, and one hardly ever finds layers of paint abutting each other along a common boundary. The paint of one area nearly always slightly overlaps that of the other, showing that the overlapping part was the last one painted. In many cases one can see with a magnifying glass which layer overlaps which; there are various criteria that can be used in determining this. It can be seen from the direction of the brushstrokes, which in the upper layer are related to the contour while in the lower they are intersected abruptly by this contour (fig. 36). The surface of the brushwork of the underlying layer is quite often to some extent visible in relief beneath the overlapping layer. Often (because of abrasion of the upper layer) such areas of overlap show the colour of the lower layer at some points in the surface. The latter feature can lead to a misconception, where there are quite large overlaps such as in the Leiden *History Painting* (fig. 37): in that case Bauch and Knuttel assumed, from the patches of wear on the relatively strong relief of the overlapped layers (fig. 39), that the painting was the work of more than one hand.[57] Looked at in the light of observations on numerous other paintings, this assumption becomes untenable, however; the overlaps observed must rather be seen as the outcome of following a fixed working sequence.

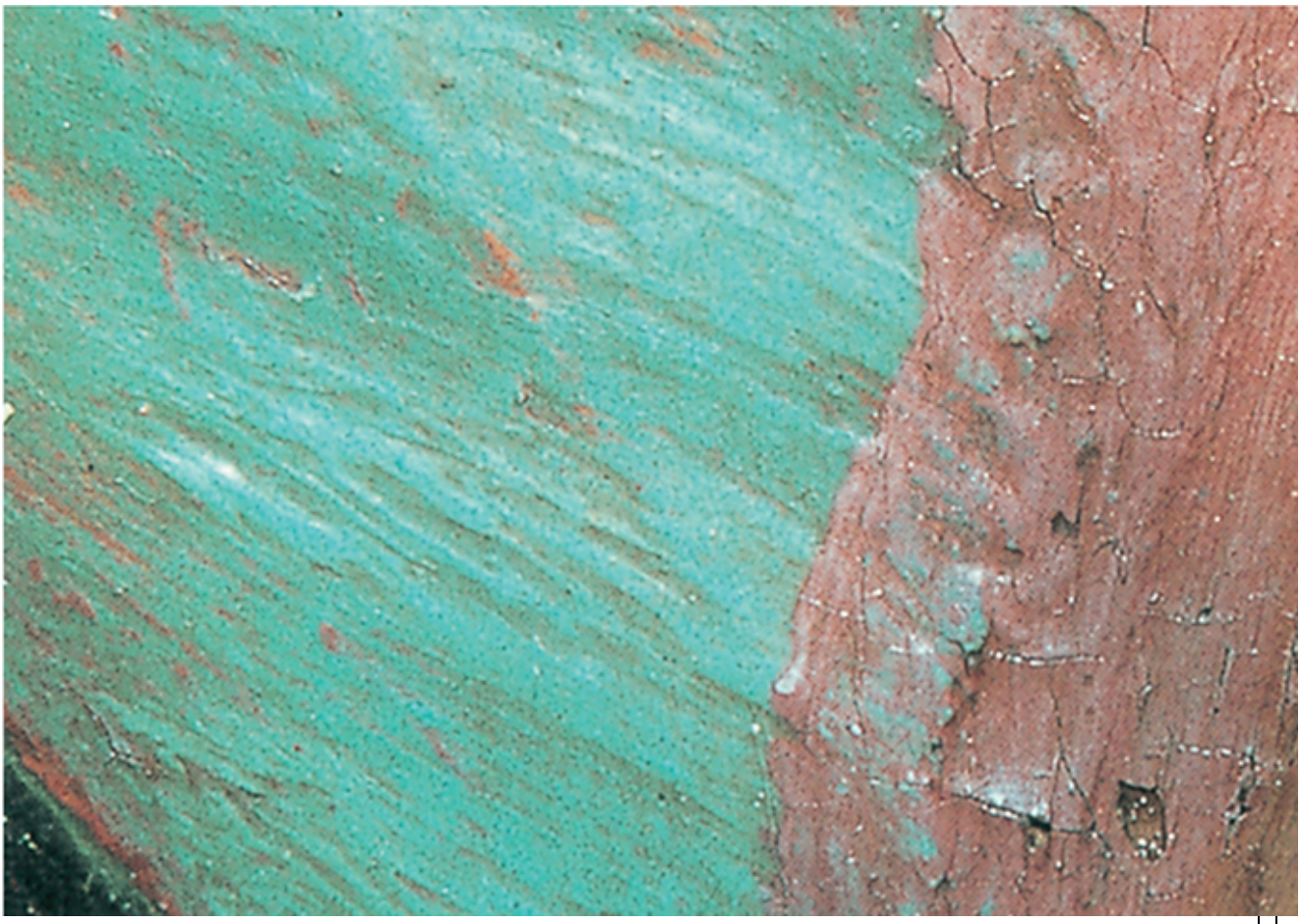


fig. 36Detail of fig. 37. Micro-photograph of an area where one passage in the painting (the paned trunkhose of the man taking an oath) overlaps another passage (the green garment of the man with the raised hands). The direction of the brushstrokes and traces of wear show which passage was executed last.

fig. 37Rembrandt, *History Painting*, 1626. Panel, 90.1 x 121.3 cm. Leiden, Stedelijk Museum De Lakenhal.*page 34, beneath left* fig. 36 Detail of fig. 37. Micro-photograph of an area where one passage in the painting (the paned trunkhose of the man taking an oath) overlaps another passage (the green garment of the man with the raised hands). The direction of the brushstrokes and traces of wear show which passage was executed last.The green layer is painted on top of a pinkish underlayer, a procedure not uncommon in this combination and apparently applied to enhance the strength of the green colour.*page 34, beneath right* fig. 39 Hand of the figure taking an oath, see fig. 37. The paint-relief and traces of wear show that the hand was painted on top of the background. The fact that there is no reserve for this arm and hand, see fig. 38, does not necessarily mean that the raised arm and the gesture of the hand were an afterthought. For the complicated background this working method was possibly required here.*above* fig. 38 X-ray of fig. 37 (see p. 36-41).

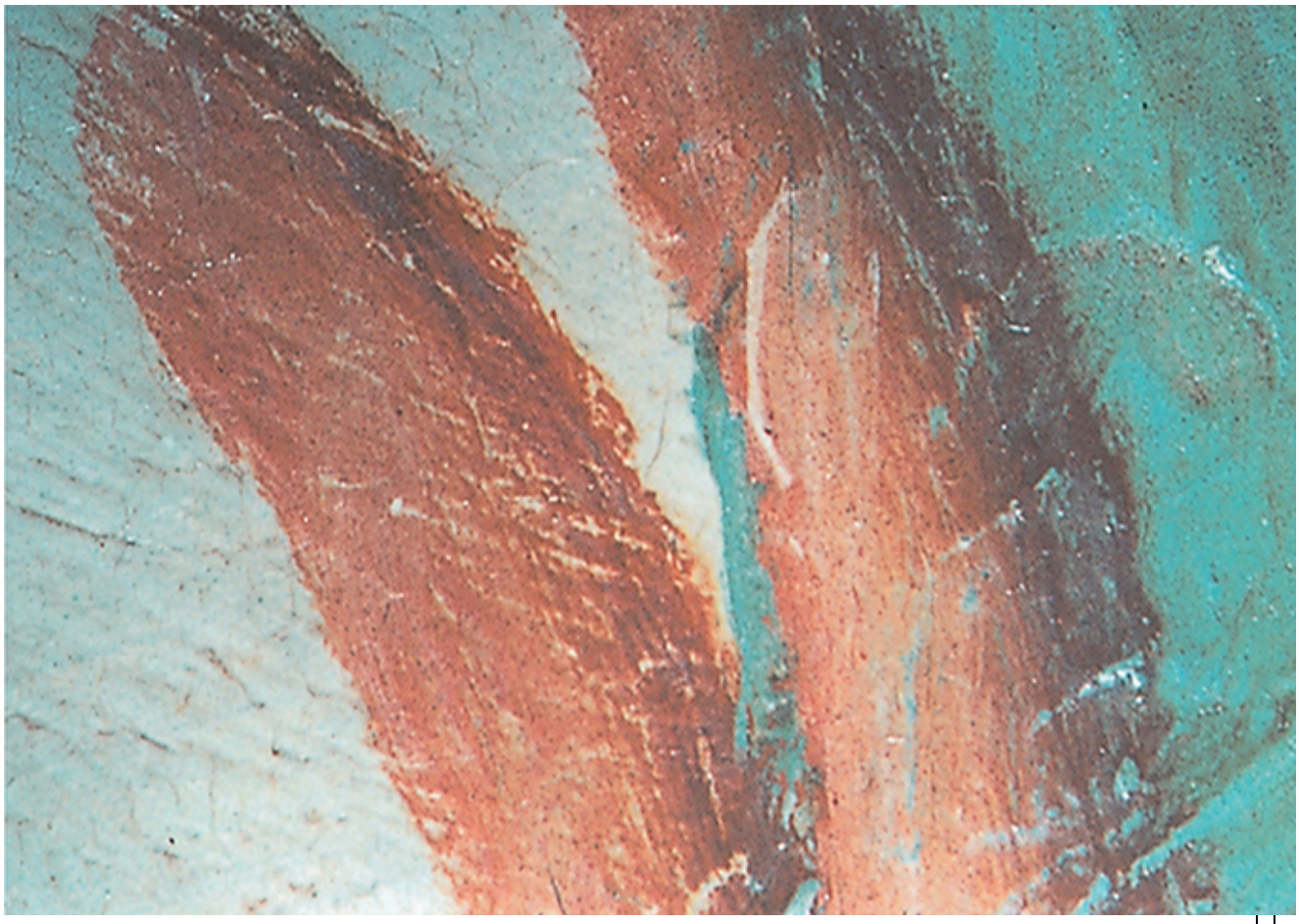


fig. 38X-ray of fig. 37 (see p. 36-41).

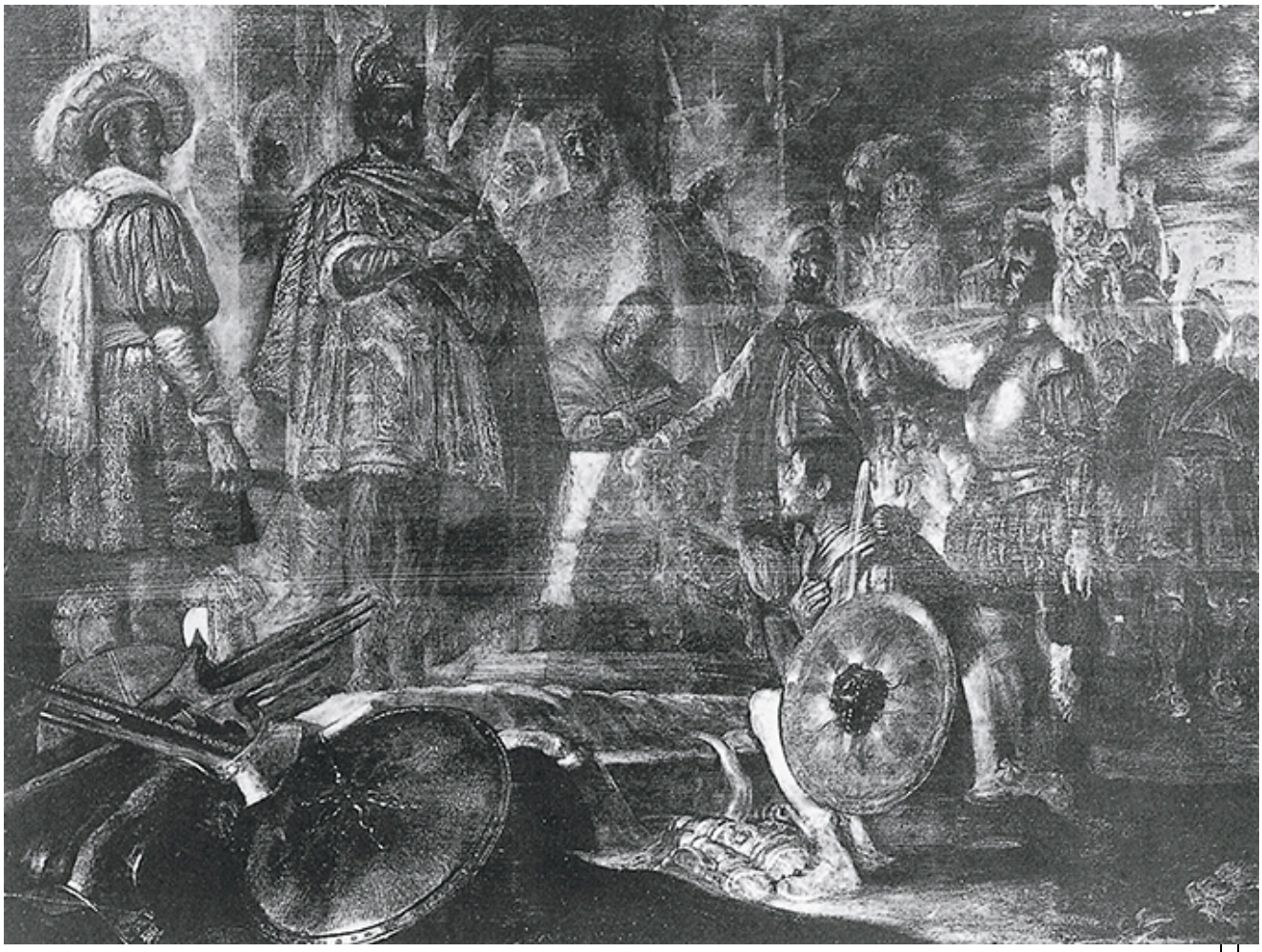


fig. 39Hand of the figure taking an oath, see fig. 37. The paint-relief and traces of wear show that the hand was painted on top of the background. The fact that there is no reserve for this arm and hand, see fig. 38, does not necessarily mean that the raised arm and the gesture of the hand were an afterthought. For the complicated background this working method was possibly required here.

The assumption that each part of a painting is 'worked up' in one session (see also Chapter VI), is born out by the overlaps visible from one part to the other, and further strengthened, when one looks within such an area, by the homogeneity of the a215a216a217paint mixture and the brushstroke pattern. As a rule, areas lying to the front of the scene overlap parts further back, and must, consequently, have been painted later. Besides the evidence provided by such overlaps, there are, however, other signs that lead one to the same conclusion that Rembrandt 'worked up' his paintings from the back to the front; these come from the X-ray photographs.

Radiography has been, and still is, used in connection with Rembrandt's paintings mainly to detect *pentimenti* (see fig. 43), to arrive at a clearer picture of his 'handwriting', and to get a fuller idea of a painting's state of preservation. On closer examination, however, X-rays have proven to provide important information about Rembrandt's painting method. In this connection the darker areas of the radiographic image almost play a more important role than do the light areas to which attention is normally directed. Figures towards the front quite often appear in the radiographic image as dark spaces left in reserve, at least in a218those cases where the artist used radioabsorbent paint in the background or middle

ground. In fact, these reserves correspond to areas of the monochrome dead colour that remained visible at this stage of the work. The reason why they can often be seen in the X-ray is that these shapes were not, or were only partially, filled in with radioabsorbent paint when their turn came to be worked up. For example, the Utrecht *Baptism of the Eunuch* (see figs. 29, 30) has parts of the chariot, the background figures and the horses as dark reserves in the sky (which is in paint containing lead white). There is no reserve for the rider's horse's tail and heels, which were painted subsequently and on top of the sky, apparently as an afterthought.

A meticulous comparison of the outlines of the shapes left in reserve in the light background, as visible in the X-ray, with the forms seen at the surface shows that the latter usually are somewhat broader than the contours of the reserves (see for instance figs. 37, 38). They must, therefore, have been a219a220a221a222painted at a later stage. This phenomenon can be noted from close comparison of a great many radiographs with the corresponding paintings, and is seen not only in the foregrounds and backgrounds but in various intermediate planes of the compositions as well (see also figs. 29, 30). We may therefore assume that Rembrandt did in fact make a general rule of working up his dead-coloured compositions from the back of the scene to the front.

Once in a while, however, one does find that the artist returned to an area towards the back of a picture; these instances can be termed *autograph* retouches. An example is the light patch on Philip's cloak below the eunuch's right arm in the *Baptism of the Eunuch* in Utrecht (see figs. 29, 30); further examples occur in the sky of the Leiden *History Painting* (see figs. 37, 38), in between the self-portrait and the bearded figure to the right of this (see also fig. 6), as well as below the head of the animal sculpture on a column in the background of the picture.

A further group of autograph retouches can be more directly related to the back-to- front sequence of working. The form left in reserve in an area towards the back might turn out to be too large, and take on a different size, shape or position during the working-up. There could then remain a bare patch so large and obtrusive that Rembrandt was obliged to incorporate it in the area lying behind it. Occasionally a retouch of this kind done by Rembrandt has remained clearly visible; an example is the right wing of the angel in the *Balaam* (figs. 40, 41), which comparison of the X-ray with the painting shows to have been larger in the initial lay-in. When the cliff behind it was being worked-up the wing in dead colour was left in reserve. Rembrandt obviously decided that the final version of the wing should be smaller than the space he had previously left for it. This left him with a large bare patch which now had to form part of the cliff-face, and to be done in the appropriate colour. The traces of this operation are clearly visible: the green – too light when compared to the green of the cliff – is painted thinly and flatly, as if the paint had been mixed quickly on the palette instead of being properly ground on the grinding stone. Other examples of autograph and ineptly done retouches where reserves were left too large can be found along the outlines of the young woman's leg in the *Musical Allegory* (see figs. 16, 17).

fig. 40Rembrandt, *Balaam and the Ass*, 1626. Detail. Panel, 63.2 x 46.5 cm, Paris, Musée Cognacq-Jay. Detail (see also fig. 227). The painting is covered with a thick yellowed varnish.

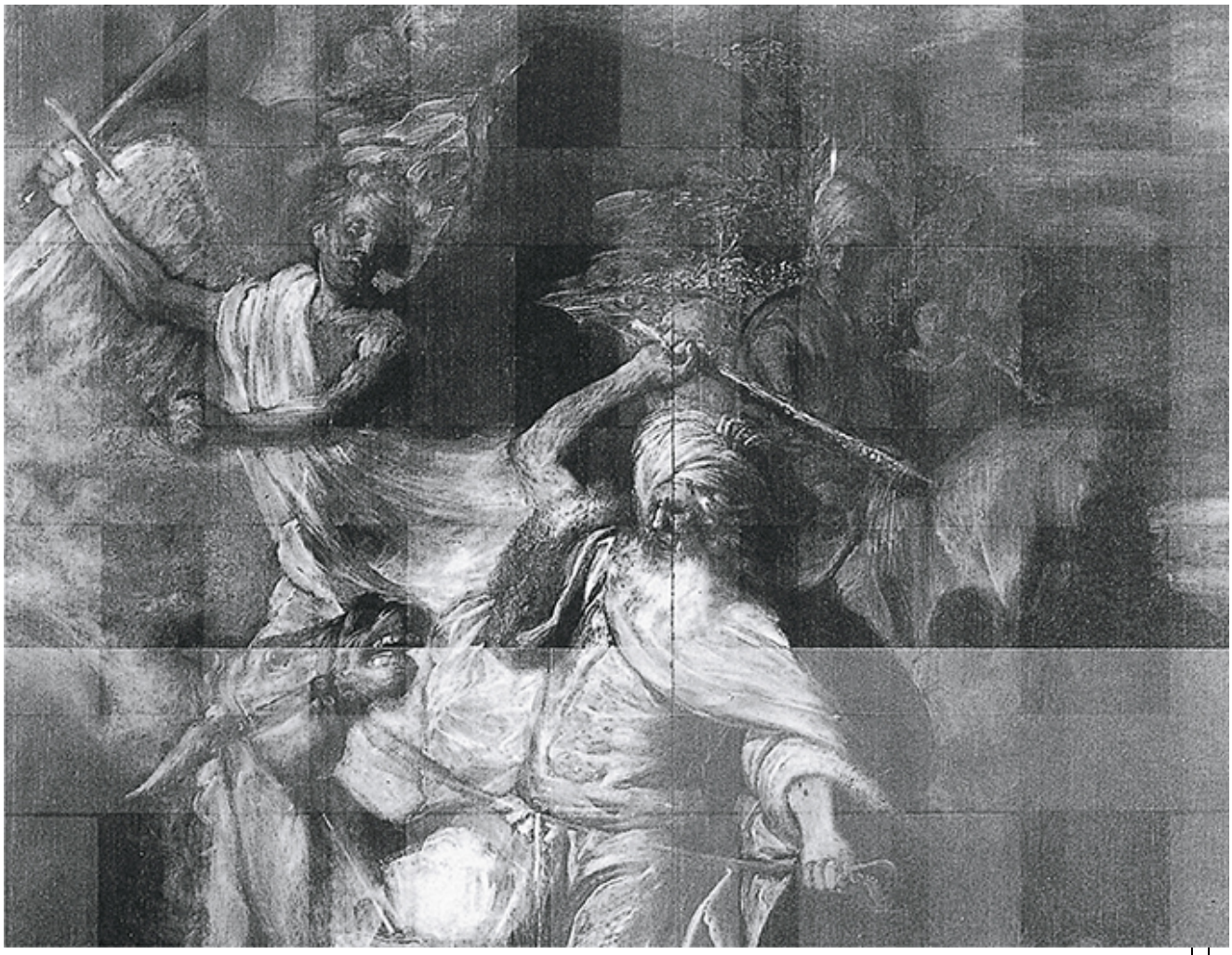


fig. 41X-ray of fig. 40. The X-ray shows a reserve in the mountain in the background for the angel's left wing which is larger than the wing that Rembrandt finally painted. The rock had to be retouched by Rembrandt to fill in the reserve for the tip of the wing (see p. 41). The panel is cradled (see fig. 10) which explains lighter grid in the X-ray (which consists of two films joined horizontally through the head of the ass).

However, it is more usual to find reserves left too small than too large. Interesting examples of this are seen for instance in the X-radiograph of the Leiden *History Painting* (see figs. 37, 38) where (judging from the dark reserves in the radio-absorbant paint showing up light) some of the figures and heads in the right-hand half must have looked slightly deformed when the areas lying further back were worked up. In other figures, especially those on the left, the final contours and the reserves left for the figure correspond quite closely. The degree of correspondence probably provides an indirect indication of the degree of detail included in the area in question in the dead-colour stage. In the case of the Leiden *History Painting* the X-ray gives the impression of the accuracy of definition of forms in the dead-coloured painting decreasing from left to right.

It is not likely that all the elements in the dead-coloured painting had a reserve left for them during the painting-in of the a225areas lying to the back. The fact that the raised arm of the foreground figure to the right of the Leiden *History Painting* is not seen in the X-ray as a reserve need not, however, mean that this gesture was a later addition (see figs. 37, 38, 39). This arm could well have been dispensed with temporarily during the 'working-up' of

the background in order to achieve the continuity the artist was seeking in the complex background scene.

Differences between the shapes visible in X-rays compared to what is seen in the painted image usually are interpreted as so-called *pentimenti*, i.e. changes during the work. For implications of that term, see p. 165. It is clear from the examples mentioned above, that certain phenomena at the paint surface and in the X-ray, which are normally referred to as pentimenti, are not in fact pentimenti in the proper sense of the word; they are in many cases features which stem directly from the method of work just outlined. The term 'pentimento' should be kept for changes made to a painting that has already been partly or fully worked up (figs. 42, 43, 44).

fig. 42Rembrandt, *The Raising of Lazarus*, 1630/31. Panel, 96.2 x 81.5 cm. Los Angeles, County Museum of Art.

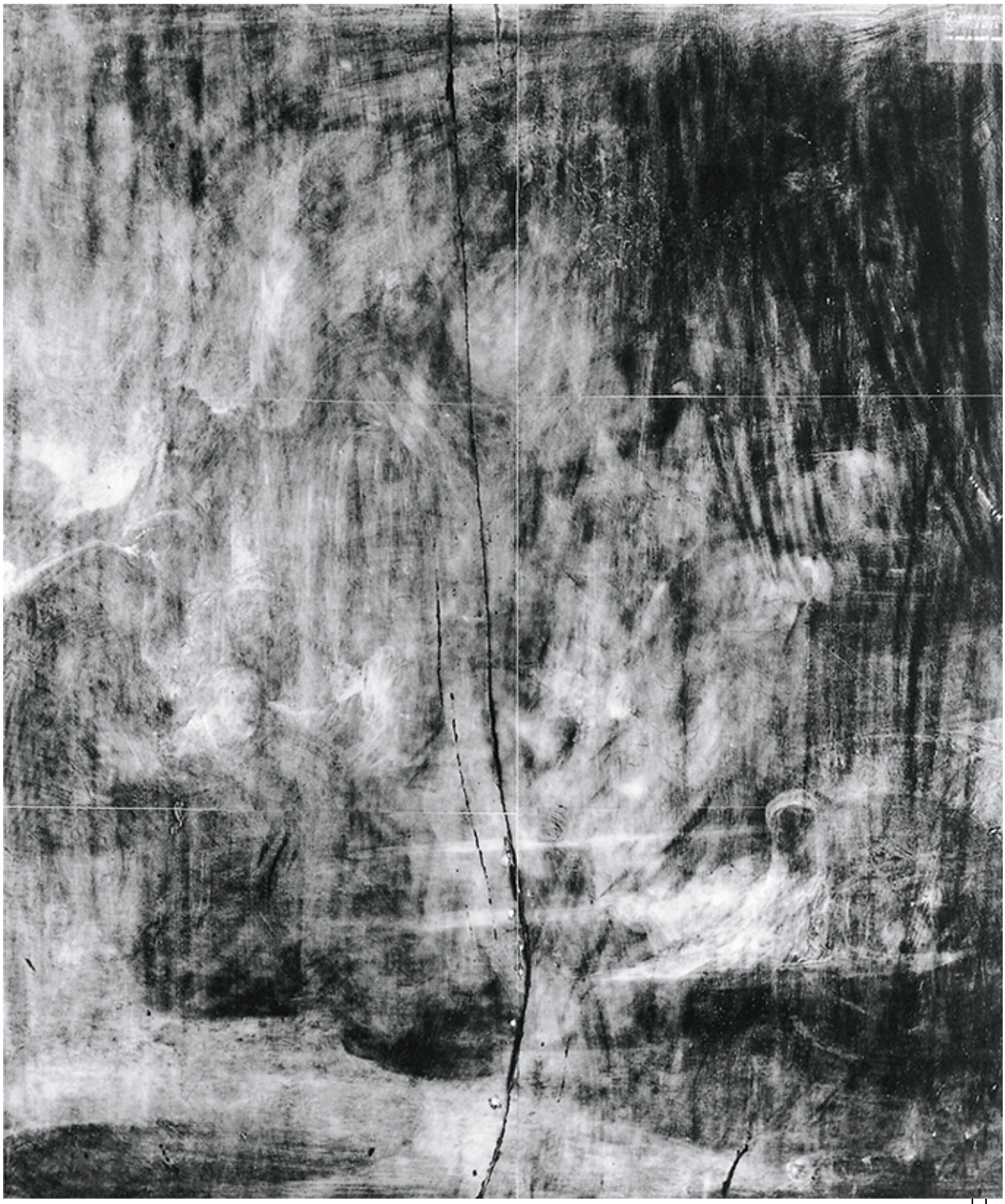


fig. 43X-ray of fig. 42. The painting has undergone radical changes. Long marks where the wet paint was scraped off can be seen in the right half of the X-ray image. Bruyn has suggested that the painting originally looked like the etching in reverse, see fig. 44, and that Rembrandt moved the Christ figure behind Lazarus' tomb and cut the panel down to the present, almost square format. The Los Angeles *Raising of Lazarus* is one of several

paintings in which Rembrandt undertook such radical changes or even painted a new composition over a picture with another subject.

fig. 44Rembrandt, *The Raising of Lazarus*, etching reproduced in reverse.

A functional reason for adopting the method of working-up the picture from the back to the front, is discussed in Gerard de Lairesse's *Groot Schilderboeck* (see fig. 189). In a number of places the author advises the artist to follow a fixed working sequence, the first time when talking about the dead colour (by which he means an underpainting in colour):

> a229*Here it seems to me that the surest and most certain way is to start from the back, especially when the landscape has most to contribute. For all things have to suit the lightness or darkness of the sky, and the tints of objects found; because the light on the foreground, and the boldness of the figures, must be matched to this, which if begun differently might turn out very uncertainly.*[58]

One gets the feeling that this argument may have been Rembrandt's most important consideration. This may be supported by the fact that the early states of a number of his most ambitious etchings have the tonal values of the backgrounds fully decided while the foreground figures are still in the sketch stage (figs. 45, 46; see also fig. 150).[59] De Lairesse also recommends following the same order in the working-up stage:

fig. 45Rembrandt, *The Angel Appearing to the Shepherds*, etching first state, 26.2 x 21.7 cm. London, British Museum. This first state shows that Rembrandt in his etchings, like in his paintings worked from back to front (see also fig. 150).

fig. 46Rembrandt, *The Angel Appearing to the Shepherds*, etching second state, 26.2 x 21.7 cm. Amsterdam, Rijksprentenkabinet.

Rembrandt
f:

fig. 46aRembrandt, *Bust of an old man*, 1631. Panel, 65.7 x 51.5 cm. Los Angeles, J. Paul Getty Museum. The X-radiograph (fig. 46b) clearly shows the painting illustrated in fig. 46a. Turned upside down, the face of a young man becomes visible. The irregular pattern of a linen fabric is due to a piece of canvas stuck to the back of the panel. The weave pattern is visible because this canvas is covered with paint which has penetrated the fabric. The canvas was probably applied after the panel comprising two boards broke along the joint. The damage of the paint along the joint caused by this accident is visible in the X-ray as dark irregular spots.

fig. 46bX-radiograph of fig. 46a.

Here one must, to adopt the best manner, start from the rear, that is to say the sky, and thus gradually towards the front... thus one keeps an easy and moist ground behind the figures so as to make their outermost circumference merge into this, which is, starting differently, impossible to achieve.[60]

The reason given here may apply to De Lairesse's own way of achieving outlines with a *sfumato* effect (see fig. 190), but not to Rembrandt's. Certainly with the young Rembrandt there is no evidence that he tried to merge the outlines of his forms into the wet paint of the areas lying behind them. The later Rembrandt uses other methods to achieve blurred outlines (see p. I 88).

De Lairesse puts forward yet another argument for working in this way; he points out the advantages that working in such a sequence offers over the relatively haphazard working-up of elements of the painting, basing his argument on the fact that paint*ings made following this latter procedure*,

thus in a disorderly way begun, take on an inevitable ugliness and deformity that make the master more embarrassed than with an empty canvas.[61]

The final argument that De Lairesse gives for the method of working from back to front of the picture is,

that it is no less agreeable than useful, namely that one becomes aware that the work is progressing, and everything in composition and spatial organisation is fitting well together, and by the fact of the eye being constantly stimulated and entertained the desire [to continue with the work] is aroused and incited as often as one looks at it.[62]

No decisive significance can be attached to De Lairesse, Rembrandt's junior by 34 years, as a direct source for Rembrandt's approach to producing a painting, although the two must have known each other (see fig. 189). Yet bearing in mind the unvarying nature of studio practices in the seventeenth century, such a detailed argument for a particular procedure can surely throw light on what lay behind Rembrandt's order of working. Another reason for this systematic manner of working will be discussed in Chapters VI and X, in connection with the seventeenth-century concept of *'houding'*.

In the process of working up, Rembrandt's manner of painting differs from one passage to the next, the variation being governed by the nature of the material to be suggested, the intensity of the lighting and the position within the scene. Especially in strongly lit foreground areas, the young Rembrandt handled his paint in a variety of ways. The rationale behind this variety will be discussed in Chapter VII.

a239The foregoing provides a sketch of the working procedure normally followed by the young Rembrandt, as a procedure basically repeated with each of his early paintings. Numerous observations made from the paintings themselves and from the a240X-rays time and again endorse these assumptions. Many details of his workshop practice may remain obscure however.

The next chapter is devoted to one of these nearly 'invisible' aspects of his daily life as an artist.a241

[h1] III Lost Drawings and the Use of Erasable Drawing Boards and 'Tafeletten'

DOI: 10.4324/9781003702764-3
a243

fig. 47Rembrandt, *Portrait of Saskia Uylenburgh*, 1633. Metalpoint on prepared vellum, rounded at the upper edge, 18.5 x 10.7 cm. Berlin, Staatliche Museen Preussischer Kulturbesitz, Kupferstichkabinett

One of Rembrandt's most celebrated drawings is a little portrait of his future wife Saskia, done in 1633, at the bottom of which the painter wrote: *'This is portrayed after my wife when she was 21 years old, the third day after we were betrothed on the 8th of June 1633'* (fig. 47). None of Rembrandt's drawings has been commented upon so tenderly. Bob Haak, usually so down to earth, wrote about this drawing: *'In fact, Saskia is more attractive here than in any other portrait of her by Rembrandt... But the eyes which saw her were in love.'* And Haak adds emphatically: *'It is drawn with the most delicate material: silverpoint on prepared vellum.'* [1]

It seems natural that Rembrandt's choice of such expensive materials was due to the youthful bliss generally ascribed to the young couple. There are, however, other drawings by Rembrandt done in silverpoint on prepared vellum, which are considerably more trivial. These drawings of landscapes and some heads on both sides of pieces of prepared vellum give the impression of having been done in extreme haste. Especially the landscapes are crudely and scratchily scribbled down (figs. 48, 49, 95, 96). It seems as if Rembrandt jotted down some elements to be used for a future landscape drawing, painting or etching rather than they were meant to serve as full-fledged landscape compositions, as he made so many on paper (see figs. 97, 98).

fig. 48Rembrandt, *Two Cottages*. Metalpoint on prepared vellum, 13 x 8 cm. Rotterdam, Museum Boijmans Van Beuningen

fig. 49*Sheet of studies*, metalpoint on prepared vellum, verso of fig. 48

a248The following chapter takes a completely different view of the preciousness and emotional significance of this technique of metalpoint on prepared vellum than Haak and others have suggested. If we follow this track it will lead us to a hitherto unknown aspect of Rembrandt's studio practice and we even catch a glimpse of his earliest years as an apprentice painter. We can find this track, however, only if we take a long roundabout route along scattered written and visual sources and the, until now neglected, remnants of a part of daily practice from the fourteenth up to the nineteenth century, *in* as well as *outside of* Holland, for *artists* as well as *non-artists*.

[h2] *Lost Drawing Exercises*

Surrounded as we are these days by paper we can hardly imagine a world without it, or one in which paper is a relatively costly item. One of the things I remember from my childhood and which has left a lasting impression, is that after the war there was no paper to be got anywhere in the village where I grew up. So I did my endless drawing exercises – horses, I drew – on a little slate. Once the slate was full, I wiped it clean with a sponge and started over again. a250As a consequence, the thousands of drawings I must have made in my attempts to figure out how to draw a horse have been lost for all time.

This experience is one of the many autobiographical 'pegs' onto which one hangs one's later experiences (we all have our own personal versions). One day I came to associate a number of art-historical observations and questions with my memory of the little boy who tirelessly practised drawing on an erasable surface which would be used over and over again.

A glimmer of that memory came back to me while I was trying in an article to sketch a picture of Isack Jouderville's apprenticeship with the then still young Rembrandt during his Leiden years.[2] Because Jouderville (1612-1648) (fig. 50) was an orphan whose guardians had to account for their guardianship in detail, there is a great deal known about him. A voluminous file has been preserved with documents of all kinds.[3] However, there is one large blank area in that wealth of documents: no drawings have been preserved that give an image of his training as an artist. Two paintings he must have made at the age of seventeen and nineteen are the earliest documents of his activity as an apprentice (figs. 50, 51).[4] Those paintings must have been preceded by countless drawings made during his learning process.

In order to get a sense of the earliest apprenticeship of a young seventeenthcentury painter, one first needs to have an idea of what kind of exercise material was given to artists' apprentices in the seventeenth century. In doing so, we must consider that what were called *leerkinderen* – 'child apprentices' – in the seventeenthcentury were just that – children, between about ten and sixteen years old. [5] A rare source of 'genuine' historical children's a255drawings can be found in the diary of Dr. Jean Héoard. In 1602 he became court physician to the crown prince who would later be the French King Louis XIII. In Héoard's diary entries there are some drawings made by the young Dauphin (fig. 52).[6] But that kind of child's drawing, quite akin to what children at that age would draw today, is not what we expect from the production of a young artist in training, even if the training was begun at a very young age.[7]

fig. 50Isack Jouderville, *SelfPortrait*, c. 1629. Panel (oval), 48 x 37 cm. Dublin, National Gallery of Ireland. Isack Jouderville was an apprentice and later perhaps an assistant in Rembrandt's studio, first in Leiden later in Amsterdam. The painting is a variation on works by Rembrandt like fig. 203

fig. 51Isack Jouderville, *Minerva in her Study*. Panel, 34.9 x 35.6 cm, Denver, Col., The Denver Art Museum. This painting is a variation on two paintings by Rembrandt of 1631 (*An Old Woman Reading*, Amsterdam and *Minerva*, Berlin). The painting may therefore have been made in the same year. It is a typical workshop product of an apprentice.

Written sources tell us that beginning apprentices mainly practised by copying prints or drawings of parts of the human body: eyes, noses, mouths, hands and feet. These were readily acknowledged to be difficult subjects to draw (figs. 53-55). In 1549, the miniaturist Francesco da Ollanda, known especially for his notes on conversations with Michelangelo, wrote:

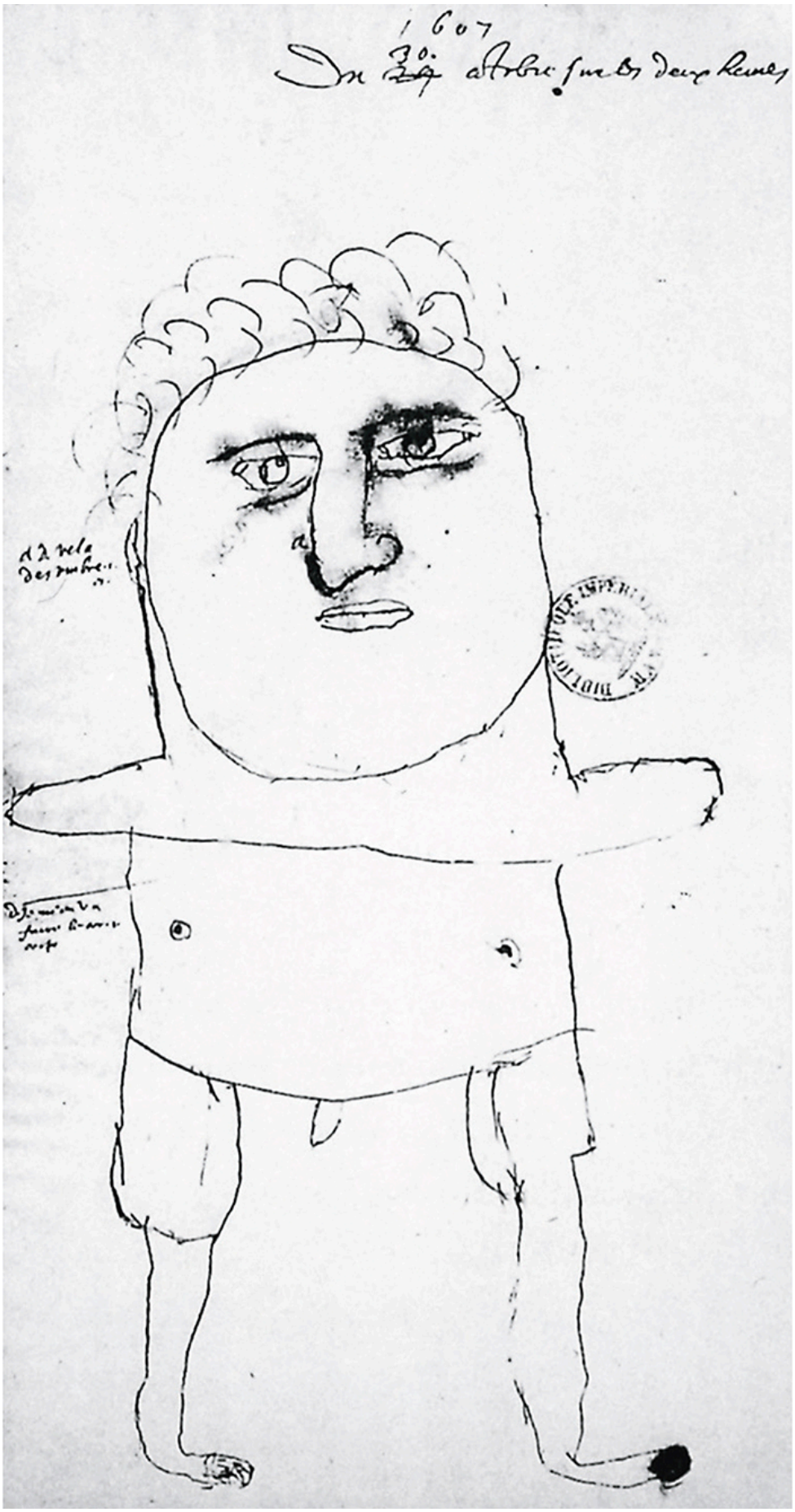

1607

fig. 52Drawing by Louis XIII at the age of six, from the diary of Dr. Jean Héoard, October 1607, Paris, Bibliothèque Nationale

He who can draw well, and draws only a foot or a hand or a neck, can paint everything created in this world.[8]

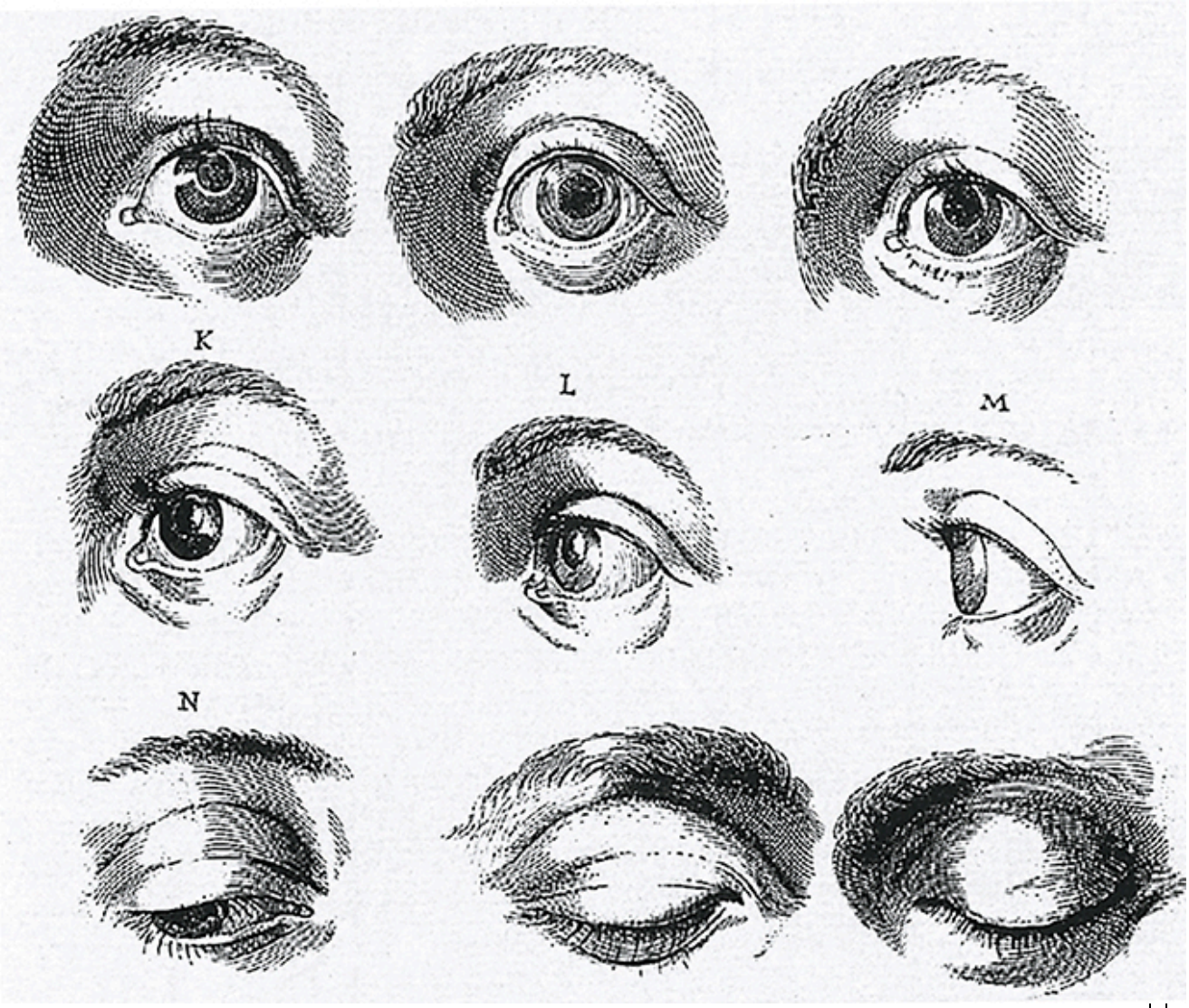
Similarly, more than a century later, in 1668 Willem Goeree, in his *Inleyding tot d'Algemeyne Teykenkonst* (Introduction to the art of drawing), stated that anyone who can draw Hercules well would have no trouble with Hercules' lion's fur or his club. In the same vein, Goeree explained why it is so helpful to draw *'Heads, Hands and Feet'* correctly from the start: namely because

> *the errors are immediately obvious and can be seen and judged by anyone: for who would be so dumb-witted and blind not to notice at once that someone had a deformed face, a crooked hand or a twisted foot?* [9]

Hence we find eyes, noses and mouths, hands and feet in every possible position among the first drawing examples in the numerous seventeenth-century drawing- books.[10]

Two prints depicting child apprentices, one from the sixteenth and one from the seventeenth century, distinctly show that in both cases the apprentices had drawn a series of eyes (figs. 56, 57). The fact that this was generally the first stage of their training is further corroborated by a comment by the sculptor and goldsmith Benvenuto Cellini (1500-1571), who stated that

> *the teachers place a human eye in front of those poor, sensitive children, as their first step in copying and making portraits. At least, that is what happened to me in my childhood, and it probably happened to others as well.*[11]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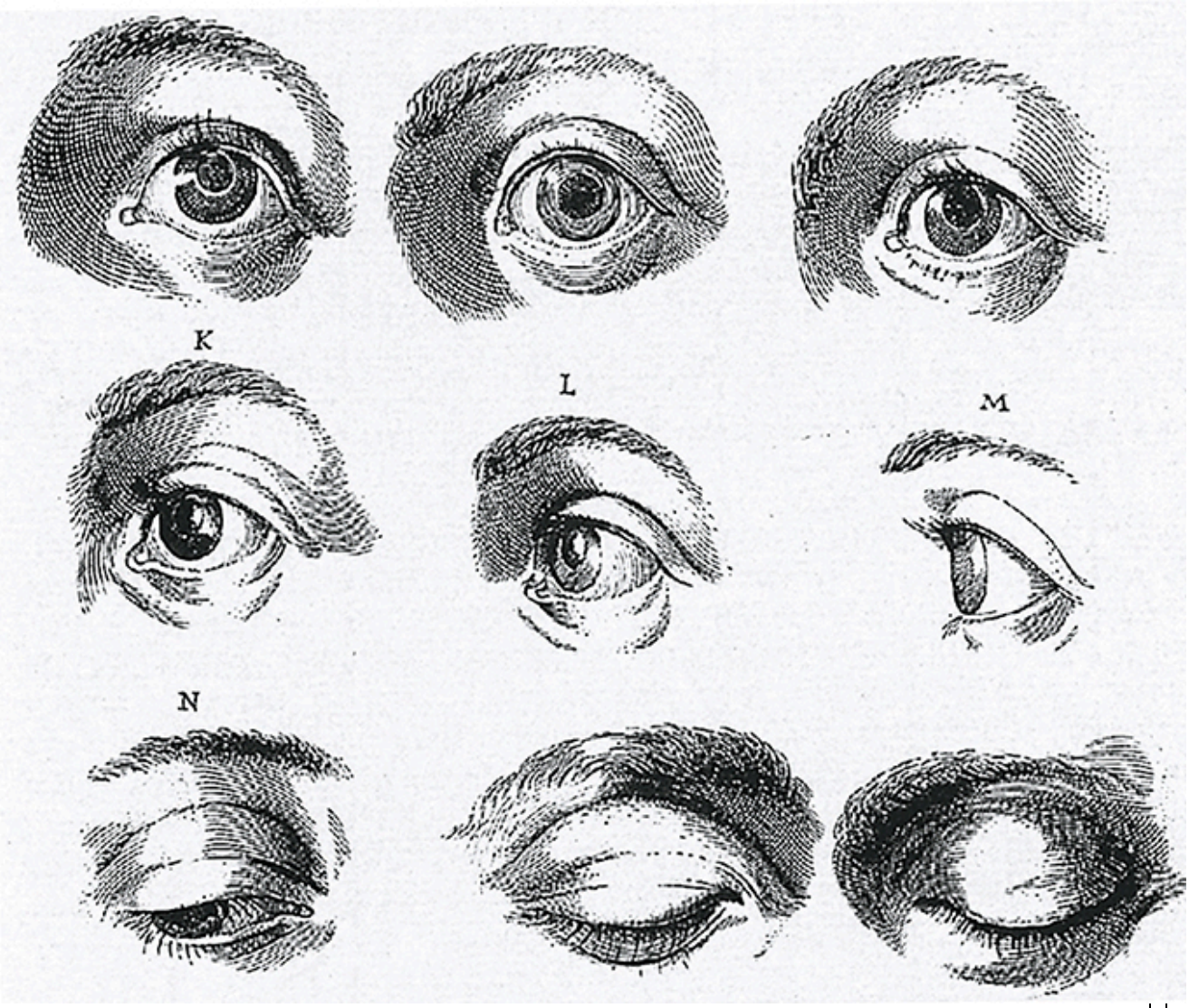
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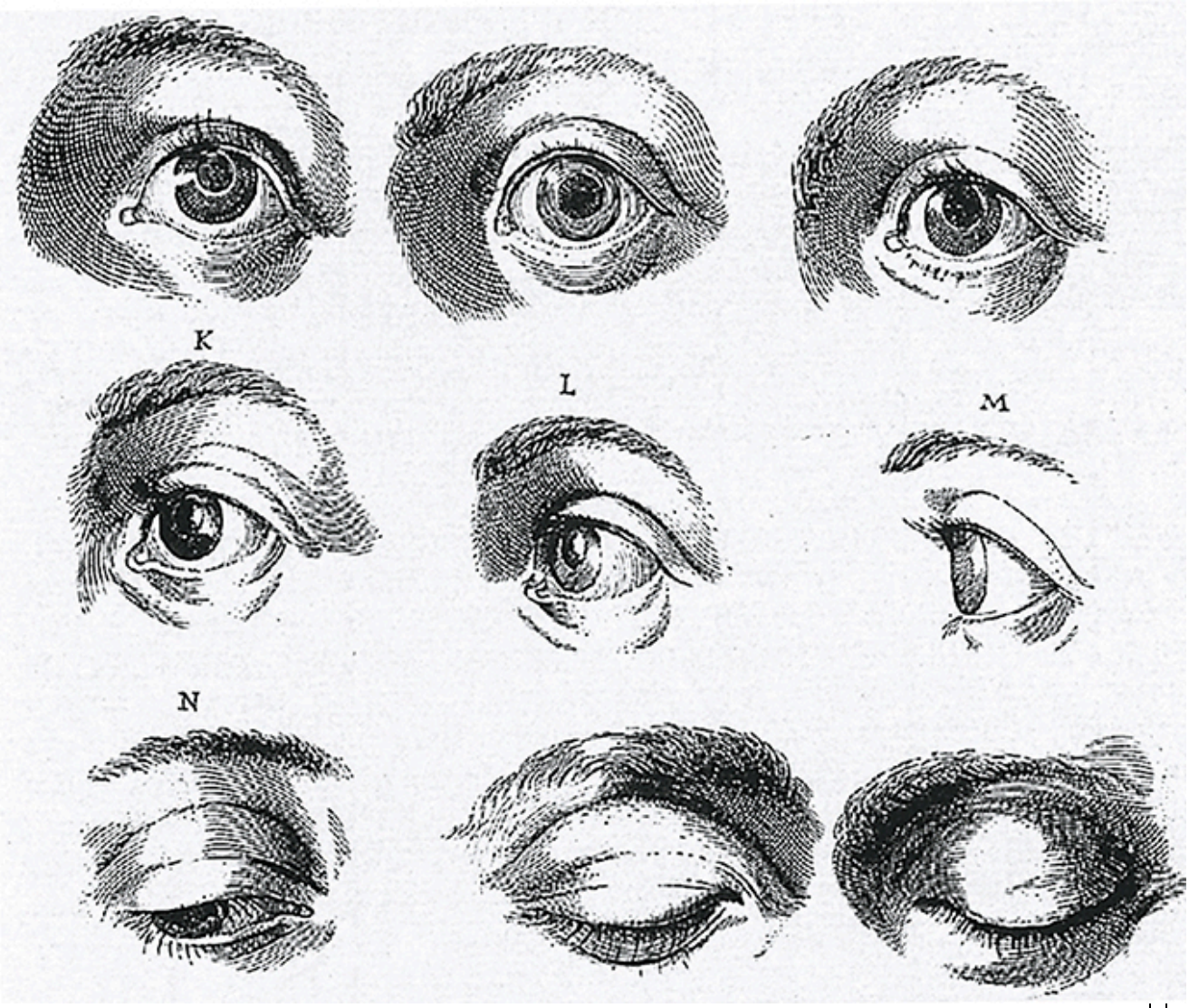


fig. 53Engraved drawing models from the drawingbook by Chrispijn van de Passe, *Van 't light der teken en schilderkonst*, Amsterdam 1643. The fact that the eye usually was the first detail to be copied by the apprentice (see also figs. 56, 57, 58 and pp. 50, 52), no doubt is connected with the special place the sense of sight had in the artist's life

a266

Nearly two centuries after that moment in Cellini's youth Samuel van Hoogstraten wrote:

> *They usually set the youth to drawing eyes, noses, mouths, ears and various countenances, and then to copying after all sorts of prints.*[12]

A painting – cryptic at first sight – by Giovannni Francesco Caroto (1486-1555) deserves consideration in this regard (fig. 58). In this painting, a laughing boy is depicted holding a child's – most likely his own – drawing of a 'little figure of a man'. To the right of the head one can see an attempt to redraw one of the eyes better. Underneath that, however, is another eye drawn in profile similarly to those that can be found in many drawing books (see fig. 53, M). The painting, at first sight a humourous snapshot, may well contain a reference to the learning process of the budding painter.[13]

fig. 56Jan Baptist Collaert after Johannes Stradanus. Engraving; detail of fig. 175

a270

fig. 57Pierfrancesco Alberti, *Academia d'Pitori*, early seventeenth century. Etching; detail

fig. 58Giamfrancesco Caroto, *Portrait of a Boy with Drawing,* c. 1525. Panel, Verona, Museo del Castelvecchio

The first phase of the training, the copying of parts of the human body, must have taken up considerable time before being mastered thoroughly. That is the only way to account for the average sixteenth- and seventeenthcentury painter's easy skill in drawing and painting the human face and body.

It should not come as a surprise to us that most of these countless drawing exercises have been lost. Drawings were collected by a few enthusiasts who must have been quite selective. This process of selection may have continued later on as well. Around the middle of the nineteenth century, the Austrian writer Adalbert Stifter (1805-1868) had one of his novel's characters, a273after having purchased a collection of old prints, weed out the poorest sheets and then destroy them. The context of this astonishing scene suggests that Stifter, who was active in the Austrian monument service, and his contemporaries approved of such an irreversible method of selection.[14]

It would seem unlikely that – after centuries – attic finds of unsorted seventeenthcentury material would still be discovered. There is one exception, however: the large collection of drawings from the Ter Borch family, containing about 500 drawings of various kinds by the apprentice painters Gerard Jr. and Moses, their sister Gesina and their brother Harmen.[15]

These drawings by the Ter Borch children were painstakingly collected, preserved and passed on to subsequent generations by the father and first teacher of the three boys, Gerard Sr., and later by their sister, Gesina. The astounding scope and abundance of this unique collection is such that Alison Kettering, in the introduction to her catalogue of the Ter Borch estate wrote, *'These sheets allow us to reconstruct Gerard's [Sr.' s] pedagogical technique in remarkable detail.'* [16]

That view turns out to have been all too optimistic, however. Of the years between 1625, when Gerard Jr. was seven years old and his first drawing was kept by his proud father, and 1633, when his training was already far advanced, barely more than one drawing per year by the eldest Ter Borch son has been preserved.

The picture of Gerard Jr.'s apprenticeship revealed by these early drawings does seem to be biased by certain types of drawings. From Gerard Sr.'s inscriptions on these sheets we can infer that the father was mainly interested in his son's own 'inventions' (fig. 59) and in his drawings 'from life' (fig. 60). Copied eyes, mouths, feet, from 'drawing-books' as discussed above, are not to be found in the Ter Borch estate, except for one with a hand that rather served as an exercise in penmanship by one of the boys (fig. 61). Another hand was drawn from life by Moses, according to his father's inscription when he was twelve (see fig. 65). Most of the collection consists of drawings after plaster casts (fig. 62; see also fig. 175), after complete prints (figs. 63, 64), and after life models (fig. 66), and drawings with free inventions (fig. 59).[17] Unless Ter Borch Sr. used a completely unorthodox teaching method, we must assume that the real exercise material from the first years of the Ter Borch boys' training is missing altogether.

As far as I know, no copy from 'Drawing-books', by young apprentices from Holland or elsewhere, has been passed down at all.

What has become of these drawing exercises of which millions must have been made by sixteenth- and seventeenth-century child apprentices? From the introduction to this chapter it should be clear that I suspect that they might have been made on erasable supports.

[h2] 'Tavolette'

In the beginning of this chapter, I had only a suspicion – based on a childhood memory – that in the past people may have used erasable supports for their drawing exercices. That dormant hypothesis sprang to life when reading the first couple of pages from Cennino Cennini's *Libro dell' Arte* (from 1390) with new eyes.[18] Cennini devoted a few very brief chapters to the apprentice's first drawing exercises and the making of a drawing tablet (*tavola* or *tavoletta*) to be used for that purpose. That part of Cennini's text has never been studied for its implications for art history, even though Meder and Watrous summarized its contents.[19] Cennini gives detailed instructions on how the novice artist should prepare a smoothly polished board of boxwood or wood from the fig tree, using a paste consisting of white, calcined ground sheep or chicken bones (calcium phosphate), bound with saliva. The white paste was applied by dabbing it with a finger onto the board to obtain a thin priming. According to Cennini, one could draw on such a ground with various kinds of metal styluses. An early visual document in which such a tablet is shown is a miniature in water-colour, ascribed to Gentile Bellini (1429-1507) from around 1480, showing a boy in Turkish garments apparently practising drawing or writing on such a tablet (fig. 67).[20] Cennini took it evidently for granted that one knew that this ground, being bound only by saliva, could be removed, or eventually would fall off – drawing and all – and replaced by a new priming of saliva with the ground-up bone ash, the white powder which, Cennini advised, should be kept dry in a paper wrapping.

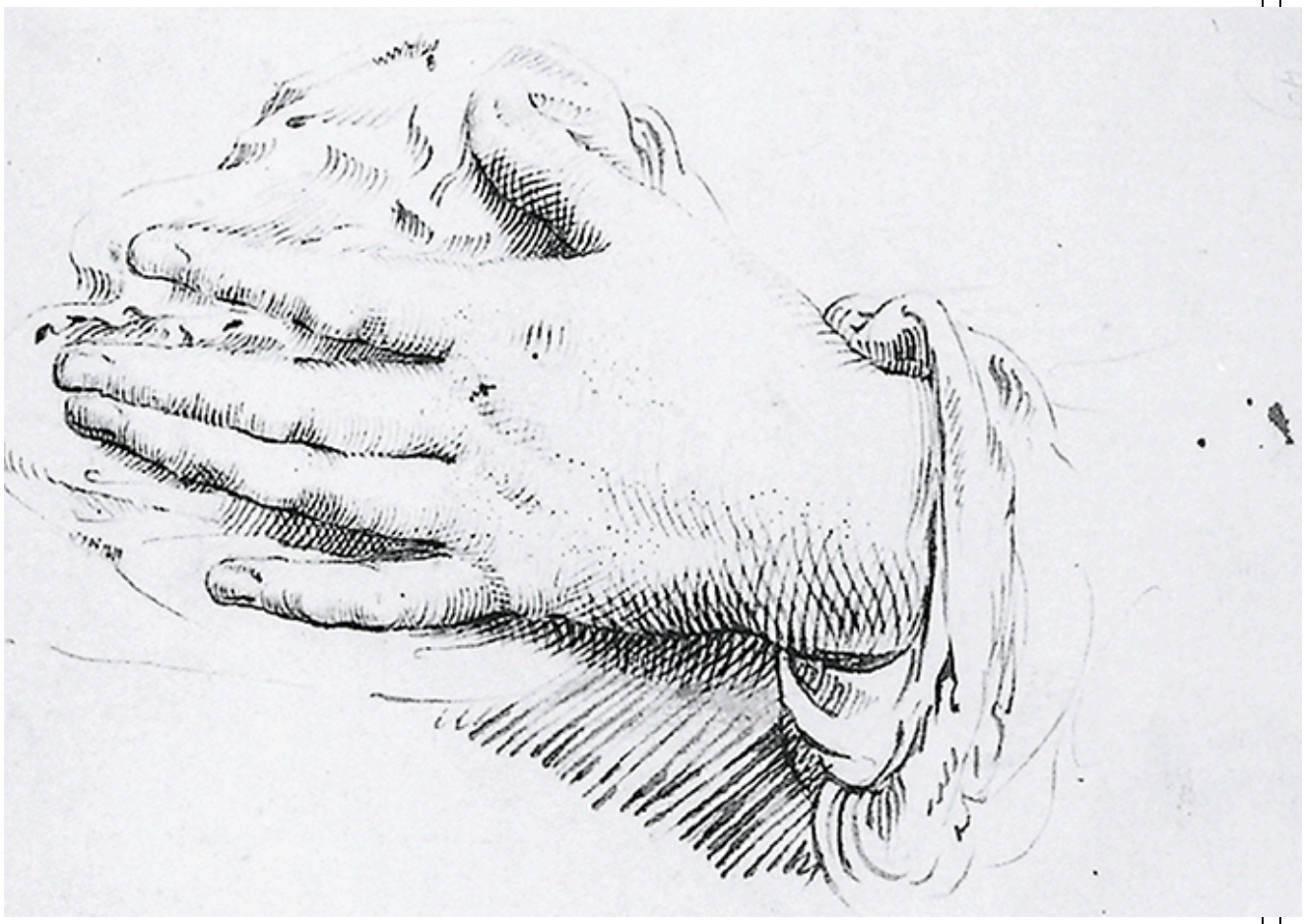


fig. 59Gerard Ter Borch, *Judith and Holophernes*, January 1627. Pen and brush in shades of brown, 14.9 x 11.1 cm, Amsterdam, Rijksprentenkabinet. Ter Borch was ten years old when he made this exercise in invention and chiaroscuro

a283

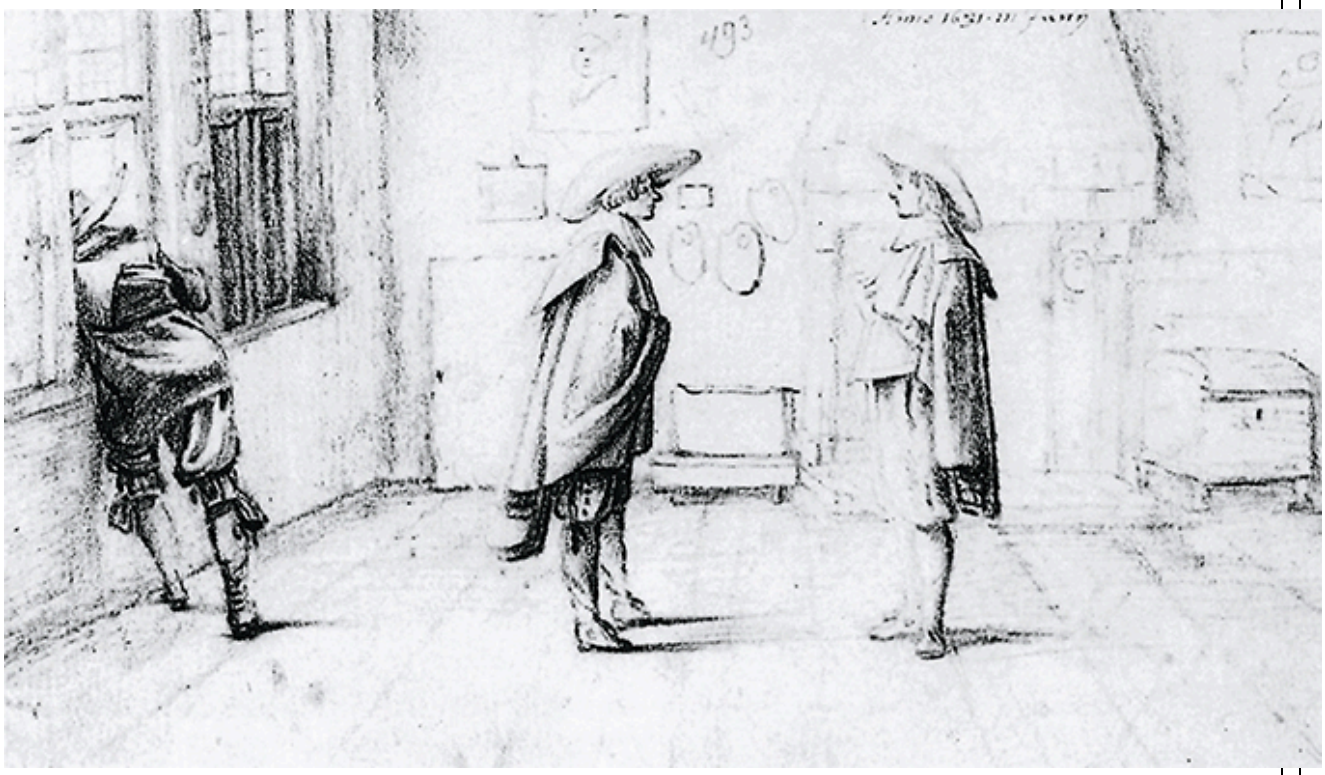


fig. 60Gerard Ter Borch, *Three Men in a Painter's Studio*, June 1631. Black chalk, 11.5 x 20.3 cm. Amsterdam, Rijksprentenkabinet. Drawn when Ter Borch was fourteen years old

627 Q.t Borch de Jonge in January

fig. 61Gerard, Harmen or Moses Ter Borch. Drawing from life or from a plaster cast, pen over traces of black chalk, 13 x 19.3 cm. Amsterdam, Rijksprentenkabinet

fig. 62Gerard Ter Borch, *The Resting Hercules*, 1631. Pen and brush over traces of black chalk, 16.9 x 9.4 cm. Amsterdam, Rijksprentenkabinet

a287

fig. 63Moses Ter Borch, copy of Rembrandt's etched *SelfPortrait* 1631/33. Black chalk, brush in black, 12.9 x 12.7 cm. Amsterdam, Rijksprentenkabinet

fig. 64Rembrandt, *Self-Portrait*. Etching, seventh state. Amsterdam, Rijksprentenkabinet

fig. 65Moses Ter Borch, *Study of a Hand*, 31 December 1657. Black chalk, 8.8 x 11.4 cm. Amsterdam, Rijksprentenkabinet. The inscription of Moses' father Gerard senior reads: 1657/Mosus ter Borch drawn after life the 31 December (Moses was then twelve years old)

fig. 66Moses Ter Borch, *Portrait of Gerard Ter Borch Senior*, 23 January 1660. Black chalk heighthened with white chalk on blue paper, 28.7 x 23 cm. Amsterdam, Rijksprentenkabinet. Moses was fifteen years old when he made this drawing

fig. 67Gentile Bellini, *Boy writing or drawing with metalpoint on a tavoletta*, 1479/80. Parchment, 17.5 x 13 cm. Boston, Isabella Stewart Gardner Museum. Bellini's drawing was in

a later stage worked up with colour, an inscription and decorative elements by a Turkish artist

a293

AMSTELODAMI
Excudebat Ioannes Ianßonius.
Anno 1616.

fig. 68Title page of a drawing-book *Diagraphica sive ars delinea- toria...*, Amsterdam (J. Janssonius), 1616 (see p. 58)

La Prima Parte
Della luca
DEL DIPINGERE
ET DISEGNARE
Eerste Deel
VAN T LICHT DER TEKEN EN SCHILDER KONST
La Premiere Partie
DE LA LUMIERE DE LA PEINTURE & DE LA DESIGNATURE.
Der Erste Theil
Vom Liecht der Reiß und Mahlkunst
HIC OPUS HIC LABOR

fig. 69Title page of Chrispijn van de Passe, *Van 't light der teken en schilderkonst* (see p. 58). The figures behind Minerva represent some Utrecht painters involved in the education of young artists

a296

fig. 70Pietro Testa, *Il Liceo della Pittura*, 1637-38. Engraving. Detail showing the first steps in the training of the artist. The *putti* on the lowest step are holding *tavole*. The boys on the higher steps are carrying drawing paper (see p. 58)

Cennini pointed out that such drawing boards could also be made from pieces of parchment coated with a mixture of lead white and oil, which could then be covered with the paste of bone ash described above. According to Cennini, these parchment tablets (he likewise called them 'tavolette') were often used by merchants who evidently performed their calculations on them. In his translation of Cennini's treatise, Daniel V. Thomson refers to a Bavarian manuscript which must have been written a century later, describing in detail how such parchment writing tablets could be made.[21] This text states explicitly that such tablets could be used over and over again, because one could use saliva to erase what was written. Given the fact that a recipe was given for erasable drawing or writing tablets around 1390 in Florence, and around 1500 in Bavaria, one may infer that such tablets were a widely-used device.

The existence of these erasable tablets seems of unexpected significance to the history of art. The edges of a gaping black hole in art history are becoming visible, the hole into which all those erased drawings have been lost irretrievably. The question 58 remains as to what extent the erasable drawing tablet was used, whether it was really only used by beginning artists (and merchants) or if adult artists also used them. The other question is how long their use continued before paper became so affordable that the erasable tablet was no longer needed.

[h2] Drawing Tablets in SeventeenthCentury Prints, a False Lead?

a300In general very few sources can be found which provide information about black holes in history, simply because of their blackness. The erasable drawing tablet is one of the subjects for which systematic research into the literature is of little help. On the other hand, on quite a lot of sixteenth- and seventeenth-century prints young artists are shown drawing on boards (figs. 68, 69). This would suggest that such boards were also used in that time. Of course one cannot be certain if the boards depicted are actually drawing tablets of the kind just described, or just stiff supporting surfaces onto which a sheet of paper was fastened. One is struck by the fact, however, that the artists took pains, where necessary, to depict the paper fastened to a supporting surface distinctly. For instance, on the monumental print by Pietro Testa, entitled *Il Liceo della Pittura* from 1637/38, we see young artists who are somewhat advanced – which is attested to by the fact that they have already reached a higher rung on the proverbial ladder of Art – drawing on paper, while the youngest pupil, who is depicted as a *putto,* holds a sharp-edged board of the kind found in many such prints (fig. 70).

The fact that contemporaries must have associated the portrayal of this kind of board with the concept of *Usus*, or exercise, is evidenced by the fact that in two sixteenthcentury allegories with explanatory captions – one, a print of a section of a mural on the façade of the house of Frans Floris (c. 1517-1570) in Antwerp, and another, a print by Hendrik Goltzius (1558-1617) – *Usus* is personified by a bearded man drawing on just such a sharp-edged board (figs. 71, 72). Should the frequent depiction in sixteenth- and seventeenth-century prints of young artists drawing on these kinds of boards therefore be taken primarily as a reference to *Usus*? In that case, we cannot simply assume that these depictions are proof that in seventeenth-century studios apprentices actually drew on erasable tablets.

There is another reason not to take these prints as definite proof that young, seventeenth-century artists like Jouderville or the Ter Borch children, or Rembrandt as a boy for that

matter, practised on such tablets. In Constantijn Huygens' autobiography from about 1630, such drawing tablets are referred to as mentioned by Plinius in his *Naturalis Historia*.

The manner in which Huygens discusses Plinius' text increases one's doubts whether the prints mentioned earlier would offer a reliable glimpse of seventeenth-century studio practice. After relating that his father, who provided an amazingly broad education for his two sons, had decided to have his children also initiated into the art of painting, Huygens continues:

> *In C. Plinius I read 'that on the authority of a certain Pamphilus, a painter from Macedonia who was familiar with all the sciences, first Sicyon and then all of Greece proceeded to instruct the freeborn children, above all in diagraphy', meaning drawing on boxwood. In that way, this subject became primary in their curriculum. It continued to be respectable in the upper class, and even the middle class began to practice it, but slaves were forbidden to do so at all times.*[22]

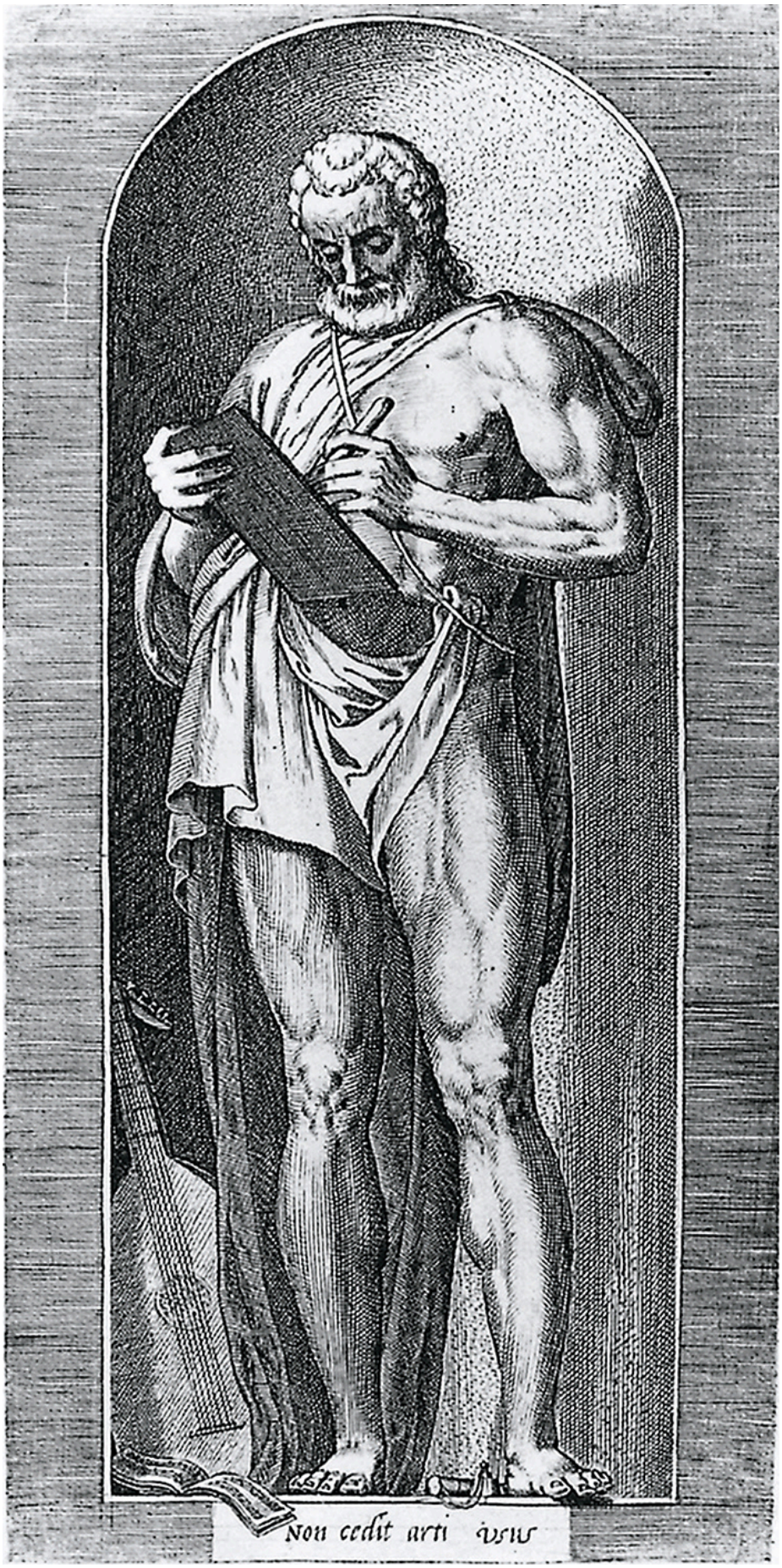

Non cedit arti usus

fig. 71*Usus, practicing on a 'tavola'.* Print after part of the painted façade of the house of Frans Floris, Antwerp, c. 1550-70

a303

One might deduct from this passage that the portrayal of young apprentices with a drawing board may have been a reference to antique 'diagraphy' (see also fig. 68) and, besides referring to *Usus*, played a role in elevating the status of the art of drawing and painting. All of the aforementioned puts our hypothesis concerning the use of the eras-able tablet in Rembrandt's time under more pressure. Samuel van Hoogstraten appears to have given the *coup de grâce* when he wrote:

> *The materials on which one draws are manifold, and the ancients already used other ones than we do. Pamfilus' Disciples drew [...] on tablets of Palm- and Boxwood; they were also made from Beech and Lime panels, which were covered by liquid wax on which one drew with an iron, ivory or wooden stylus. And one could use these waxed drawing tablets many times over; because if the Drawing was unworthy of the tablet one could just reheat the wax and thus the bungle was destroyed and the Tablet just as ready for use as before. And by this method one did not see as many useless drawings as nowadays abound.*[23]

Quisquis amore bonas exercet sedulus arteis, Diemet staden bemind Consten t'Exercereen
Congeret obryzum multa cum laude metallum. Hem beladen beuint met veel Ryckdem in Eeren

fig. 72Hendrik Goltzius, *Arts and Usus.* Engraving. Usus is holding an ink-pot and is apparently shown while drawing with a pen. The fact that he draws on a 'tavola' is to be seen as an indication that he is practising

Hoogstraten is indeed referring to erasable supports for the artist, but only in connection with the 'ancients'. There is not a word about contemporary drawing tablets a306or other erasable supports meant for reuse. On the contrary, Hoogstraten gives the impression that in his day all types of drawings were done on paper, and only the 'ancients' worked on erasable supports. As will be shown below, erasable supports were, however, definitely used for drawing (and writing) on in the seventeenth century. Hoogstraten's text therefore should probably be understood as an indication that working on paper had become much more common in his day, as compared to previous times. His omission of any reference to the *white* erasable drawing tablet, described in the sources, may be an indication that Hoogstraten – as so often in his book – primarily wanted to show off in this passage his knowledge of classical texts.

[h2] 'Tafeletten' and 'Tablets à Papier'

There is ample evidence that in the past, drawings by young aspiring artists were obviously rarely made on paper (fig. 73). According to Vasari, the young Giotto (1266/7-1337) drew on *'everything; on the rocks, on the ground, on the sand'.*[24] When seven or eight years old, Hendrik Goltzius, according to his biographer and friend, Karel van Mander (1548-1606), *'covered everything in the house or elsewhere, the woodwork, the floors and the walls, with drawings'.*[25] There are many such stories.[26] They signal a phase in the history of children's drawings defined by what Wolfgang Kemp, in his book on the history of drawing by amateurs, referred to as *die Materialfrage* (the question of mate- rials).[27] Before the introduction of paper in Europe – in about 1300 – materials to draw on were not yet as abundant as nowadays. Wax tablets, such as those described above by Hoogstraten, were used as 'sketch-books' from classical antiquity on up till the Middle Ages.[28] Wax is a darkish substance and the tone of the wood of the wooden tablets somewhat lighter. The 'tavolette' with their white ground, to be written or drawn on with a fine 'dry' metal stylus which left a dark line, must have been experienced as a great improvement.

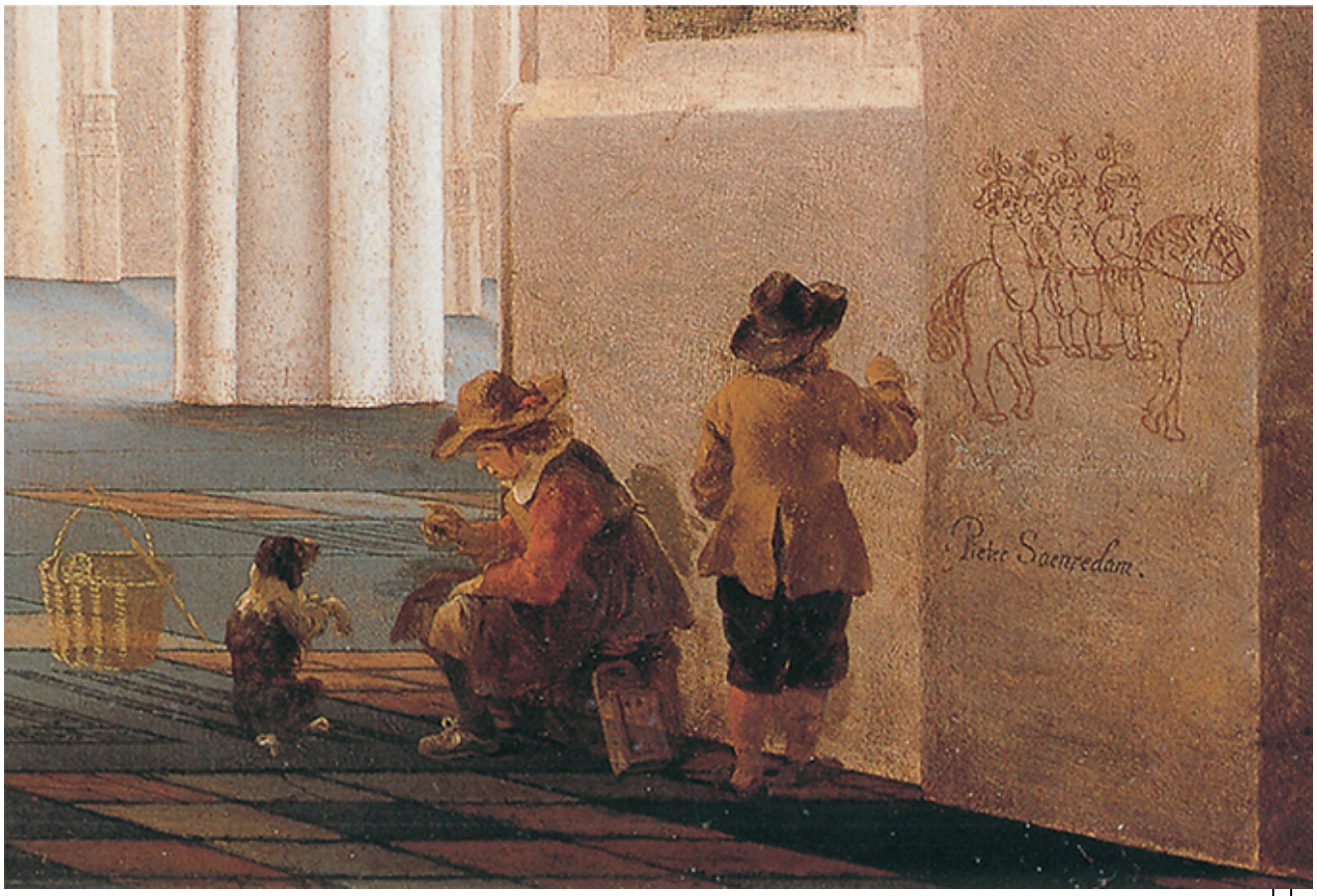


fig. 73Pieter Saenredam, *Interior of the Buurkerk at Utrecht*, 1644. London, National Gallery, detail. Boy drawing on a wall. The other boy teaching a dog is, as J.B. Bedaux has argued, most likely a reference to the learning process

That the *tabulis ex pergameno* was used in Bavaria around 1500 proves, as we have said, that the use of erasable writing or drawing tablets must be seen as a historical reality for the period of at least 1390 up to 1500. A seventeenth-century document, to be discussed later, appears to furnish proof that erasable supports were still in use around 1630. They must therefore most likely have been used in the sixteenth century as well. Meder, in his book on the history of drawing, does mention the existence of some sixteenth-century wooden boards that have (or have had) drawings on them. But it is a314not immediately obvious that these were erasable supports.[29] Meder does not pose that question. Along another route we find the trace of erasable tablets in abundance, however.

In Karel van Mander's *Levens*, published in 1604, an object called a *tafelet* is mentioned twice in connection with two sixteenthcentury artists.[30] The Dutch word 'tafelet' can be translated as 'small tablet'. The similarity between the term 'tafelet' and Cennini's 'tavoletta' suggests that both terms refer to the same type of object. An analysis of the passages in Van Mander's texts lends support to this supposition.

In his biography of Joachim Patenier (died c. 1524), Van Mander mentions the fact that Albrecht Dürer, during his visit to Ant-werp in 1521, *'made a portrait of Patenier on a slate or perhaps a tafelet with a copper stylus very excellently executed'*.[31] The fact that a 'tafelet' is mentioned here in the same breath with a slate, the erasable support par excellence, may well indicate that a 'tafelet' was indeed an erasable support of some sort. And the fact that Dürer in his diary refers to a *Büch-lein vom Silbersteft*, and actually had one with him on his

trip to the Netherlands will prove to be an important piece of information in this regard (see figs. 88, 89).[32]

The other 'tafelet' mentioned in Van Mander concerns Hendrik Goltzius. In his catalogue of the drawings by Hendrik Golt- zius, when commenting on Van Mander's mention of a 'tafelet' in the *Life of Henricus Goltzius*, Reznicek defines a 'tafelet' as a small, prepared panel which he implicitly assumes to be used only once. Goltzius is known to have used a metal stylus as a drawing tool, but Reznicek explains its use by surmising that Goltzius was temporarily applying an archaic style, using an, in Reznicek's view, at the time already obsolete technique.[33] The way in which Van Mander describes the use of the 'tafelet' in his *Life* of Goltzius, however, points in a different direction. Van Mander says that Goltzius during his travels in Italy (from 1590-1591) once was summoned to the presence of some young German noblemen, one of whom wished to be portrayed on a 'tafelet' in order to have it (his portrait) subsequently engraved.[34] From the incident with the German nobleman it is clear that the drawing was not seen as the final result of Goltzius' action but as a working document, made in the service of a final product to be created in the future, an engraving, or possibly an engraved medallion such as those Goltzius is known to have made (fig. 74). What Van Mander calls a 'tafelet' may be viewed, even solely on the basis of the two passages on Dürer and Goltzius, as an erasable drawing board, comparable to Cennini's 'tavoletta'.

As mentioned above, this assumption is supported by the fact that a detailed seventeenth-century formula exists which proves that at that time, Cennini's 'tavoletta' certainly had not yet become obsolete. It is a formula in the manuscript of the physician at the English court, Theodore de Mayerne (1573- 1655), a man with a broad interest in chemistry, an interest which in particular extended to painting materials and methods. Since he knew many important painters closely between about 1620 and 1646, his manuscript is of inestimable value to our knowledge of seventeenth-century artistic practice. The manuscript is usually consulted in that context, which is the reason why the recipe for *papier à tablette* has escaped attention until now, apart from a brief reference a321by Meder. The term 'papier à tablette' is significant because, although the text concerns a formula for the priming of paper, its similarity to the recipes for Cennini's 'tavoletta' and the Bavarian 'tabulis ex pergameno' is unmistakable. De Mayerne's formula describes the preparation of a heavy piece of paper by applying white powder made of calcined bones – the same material as mentioned by Cennini, but this time bound with a heavily diluted gum arabic instead of saliva.[35] According to De Mayerne's text, one could write on such a ground with silverpoint. The writing could be removed using a brush with water, after which a new ground could be applied, and the same support was ready for reuse. De Mayerne added a second recipe in case the 'papier à tablette' was to be used this way over a long period of time. In that case, the paper could be coated with a varnish after which one could write on it with a pen. The writing could then be removed with a moist sponge, over and over again. At the end of the eighteenth century a similar recipe, again prescribing bone ash with gum water, was recorded.[36]

ANDE EO OMNIA
ETA SVA 57
ANNO. SALVTIS 1580

fig. 74Hendrik Goltzius. Print for which a portrait medallion engraved in silver is used as a printing plate, hence the lettering being in reverse

The necessity for using 'tavolae', 'tafelet- ten' or 'papier à tablette', instead of paper, must have depended on the development in paper prices after paper was introduced in Europe. This development has not yet been studied in detail. There is no question that paper was a relatively expensive article. The paper historian H. Voorn estimated the average price of a ream of paper (470 to 500 sheets), to be the equivalent, in seventeenthcentury terms, of the weekly wages of a workman.[37]

[h2] Surviving Dutch 'Tafeletten'

After our speculations based on written sources, we suddenly have, by following the Goltzius track, a whole series of 'tafeletten' – albeit mutilated ones in most cases. They are small, sometimes even minuscule pieces of parchment, prepared on both sides, which appear to be cut from a larger whole, and often with an extremely meticulously executed portrait, done in metalpoint, on one side. The passage in Van Mander's *Life* of Hendrik Goltzius, in which he is told to portray a young German nobleman on a 'tafelet', suddenly turns out to be richly 'illustrated'. A group of these fragments, found in particular in Teyler's Museum in Haarlem and the print-room of the Rijksmuseum, has been ascribed to Goltzius' hand. The conviction that we have indeed fragments of erasable 'tafeletten' here, is based on the widely varying degree of elaboration, of these small, silverpoint drawings. Another argument is that there are sometimes clear traces of earlier use, to be described below, on the same surface, of some of these tiny sheets.

fig. 75Hendrik Goltzius, *Portrait of Christiaen Rodenburgh* (?). Metalpoint on prepared vellum, 8.5 x 6.2 cm, c. 1595-1600. Amsterdam, Rijksprentenkabinet

a328

6
A 333
3 1/4 d
2 1/2 d
Christiaan
Rodenburg
REMBRANDT

fig. 76Hendrik Goltzius, verso of fig. 75, metalpoint with fragment of sketch of two women and traces of other, erased, sketches. The way in which the group of women has been cut off shows that this little sheet of prepared vellum is a fragment of a larger sheet.

fig. 77Hendrik Goltzius, *Portrait of Jan Nicquet.* Metalpoint on prepared vellum, 9.6 x 7.8 cm, c. 1595. Amsterdam, Rijksprentenkabinet. This drawing appears to be finished and signed by

another hand.

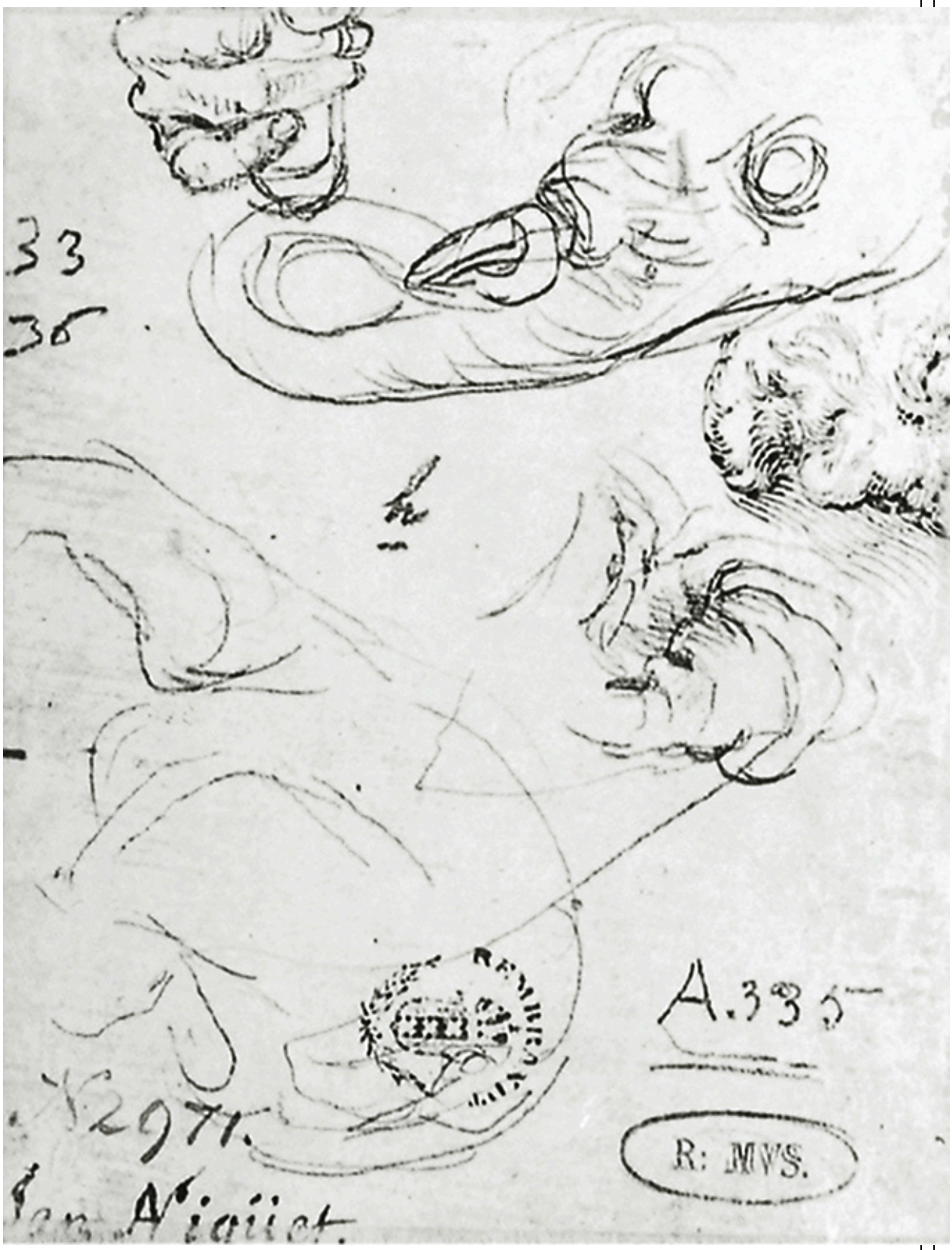


fig. 78Verso of fig. 77 Three sketches in metalpoint of an Elephant: the head; part of the tail; and the body and three legs of the animal seen from the back while getting up from a lying position. Fragment of a hand holding an object, also in metalpoint. The fragment of a head of a bearded man is done in pen and ink. Just as with fig. 76, it is clear that this is a sheet cut from a larger sheet.

As far as the degree of finish in these portraits is concerned, in the majority of cases only the head has been elaborated, while as a rule the collar and torso are either missing or are extremely scantily defined (figs. 75, 77, 79), so scantily that some of these drawings have been 'finished' by a later hand, usually in pencil. This was done with the apparent intention of making them somewhat presentable. For the same reason, these fragments were often given a dark or gilded border by a later hand. In their original state the main purpose of these drawings, as far as they concern portraits, appears to be the rendering of a precise likeness of a sitter to be portrayed in another medium afterwards.

fig. 79Hendrik Golt- zius, *Portrait of Petrus Forestus.* Metalpoint on prepared vellum, 1586. Haarlem, Teylers Museum

a333

ÆTAT. SVÆ. 64. Aº J 586.
Cæ viuum vt videas, oculis atque ore Foreſtum
Goltzius hîc mira dexteritate dedit.
Non tamẽ ingenium manus æmula reddidit, ægris
Et quæ Pæonia præſtitit arte ſuis.
Hæc libri referunt, ſupplent ſic ſcripta Foreſtum
Etſi non totus detur in ære tibi.
N.F.A.

fig. 80Hendrik Golt- zius, *Portrait of Petrus Forestus.* Engraving second state after the sketch in fig. 77

Examination of the backs of these portraits reveals that these must often have been fragments of larger sheets. Most of the time the other sides also contain metalpoint sketches, inscriptions and scribblings of all kinds (besides the inevitable notes by the subsequent collectors on what they considered to be the less important 'verso'), which have been cut in such a way that there can be no doubt that the sheets were originally larger (figs. 76, 78). Reznicek already suggested that they were initially pages of small books, without discussing, however, the possibility that these books may have contained erasable pages and not linking these drawings to Van Mander's mention of Goltzius' use of the 'tafelet'.[38] As will become apparent by the evidence presented here, these books were in fact indubitably sketchbooks, made to be used over and over again and they turn out to have been referred to as 'tafeletten'.

The tradition of binding supports suitable for reuse – in particular, wax tablets – into small volumes (from *diptychs* and *triplices* up to *multiplices*) already existed in classical antiquity and was also common in the Middle Ages; some of these booklets with wax tablets have even been preserved (see note 28). 14th-16th century bound, wooden drawing tablets with a white ground have also been preserved in a few cases, without being recognized as erasable sketchbooks up until now (see note 29). The parchment 'tafeletten' such as those used by Goltzius, were, it will soon become clear, also collected into sheaves to form a booklet.

a336Such booklets must have been very common implements in the seventeenth century, as is shown by a text by the Dutch poet Pieter Cornelisz. Hooft (1581-1647). That text provides evidence that the term 'tafelet' as it occurs twice in Van Mander's *Levens*, may indeed refer to a booklet of writing or drawing tablets. Two protagonists in a scene from Hooft's comedy *Warenar* from 1617, have the following dialogue with reference to a contested sum of money:

Ritsert*Where is the specification?*

Lecker*I have it in my 'taf(e)let'.*

Ritsert*Let me read it.*

Lecker*As soon as I come home I will make a fair copy of it.*

Ritsert*I have other things to do, show it to me, why this shilly-shallying?*

Lecker*I don't have the tafelet in my pocket any more.*[39]

We can gather from this text that in the seventeenth century one wrote *in* a 'tafelet', and that therefore it must have been a booklet, that one made a fair copy of what was written in the 'tafelet' at home, and therefore that booklet was used for provisional notes. Furthermore the text implies that the owner of a 'tafelet' was expected to carry it in his pocket at all times. A 'tafelet' was thus used as a sort of notebook or sketchbook. The reader will remember that in the case of the drawing the German nobleman wished to have made on – or rather probably in – Goltzius' 'tafelet', this drawing was explicitly considered to be an intermediate step in order to arrive at some type of engraving as the final result. As described earlier, the portraits with metalpoint on prepared vellum ascribed to Goltzius have just that preliminary character, and were not meant to be shown as an independent work

(see figs. 75, 79). Only in rare instances was the drawing developed further and signed (see fig. 77), probably by another hand. This may be an indication that these little drawings were in themselves sometimes desirable, which must have determined their survival. Such certainly must have been the case with Rembrandt's portrait of Saskia (see fig. 47) which, as will be clear by now, I consider to be the page of a 'tafelet'.

Evidence that the Goltzius drawings were indeed made on supports intended to be erasable is provided by the fact that traces of other drawings, which must have existed previously on the same side of the support, are still visible. This inference we may draw, for instance, from the presence of indentations which are linked to another image. Sometimes there are traces of previous metalpoint drawings or of inscriptions which were removed with moisture (see fig. 76). This washing off was apparently also done when making corrections while drawing. (For traces of the washing off of a whole surface, see figs. 90 and 91.)

fig. 81Tafelet, bound in brown leather, bolted with a pointed metal needle, at the same time the stylus for drawing and writing. Around 1590. 10.5 x 7.8 cm, Amsterdam, Rijksmuseum

(compare fig. 82)
a339

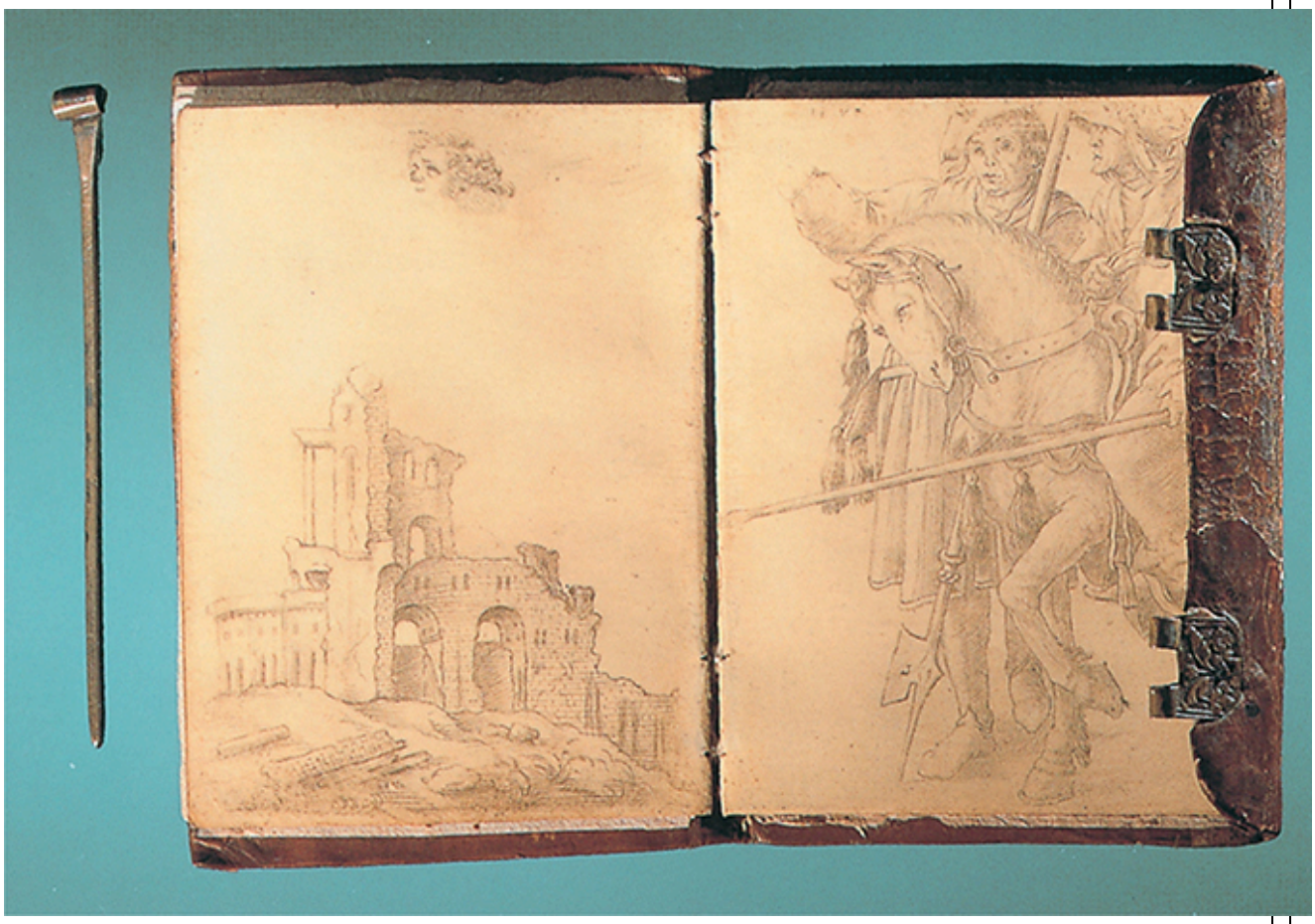


fig. 82The tafelet in fig. shown in open position. Fol. 2 verso shows a *Sketch of a Ruin*, after an unidentified print, and a child's head. Fol. 3 recto shows figures copied from a print by Lucas van Leyden (see fig. 83)

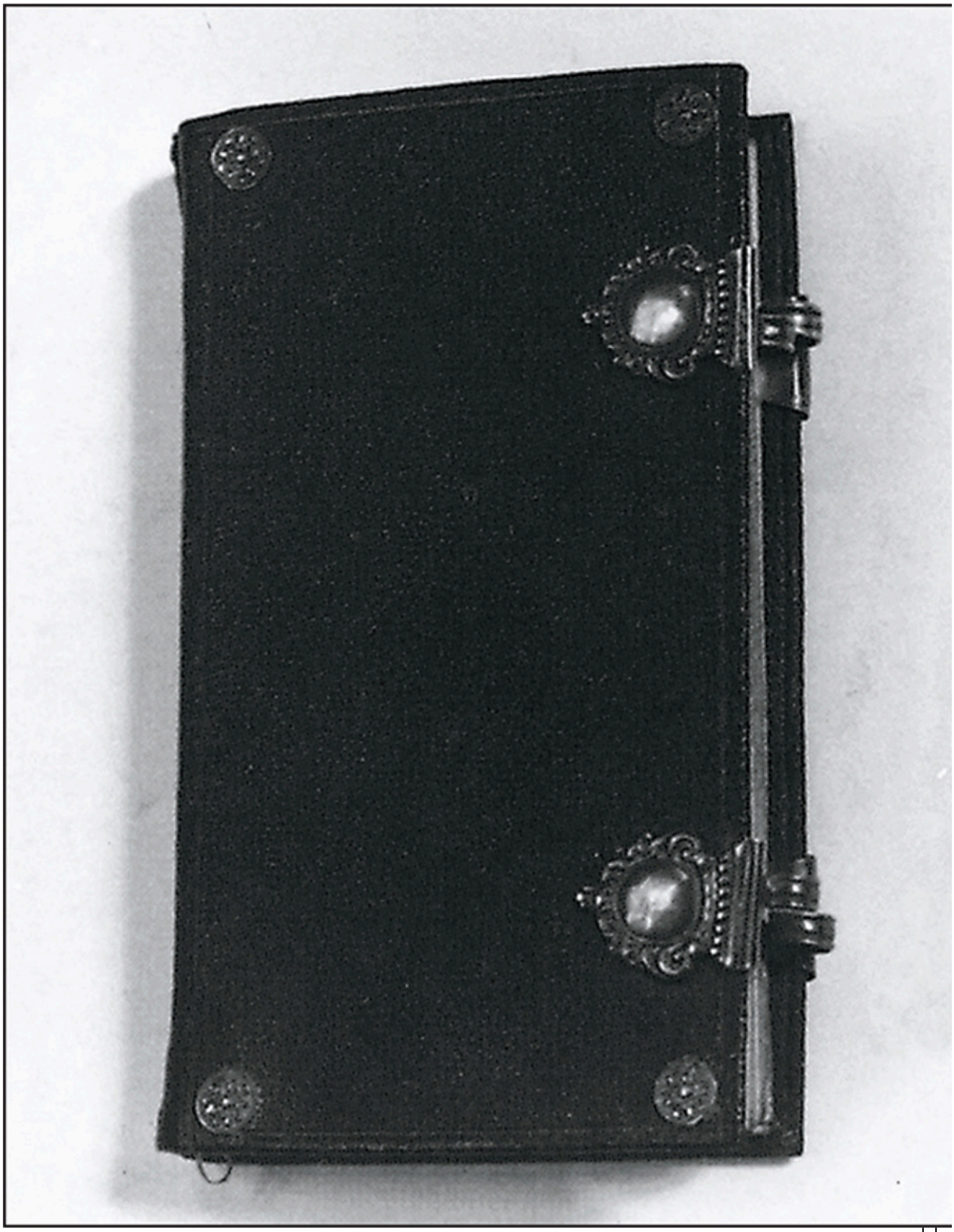
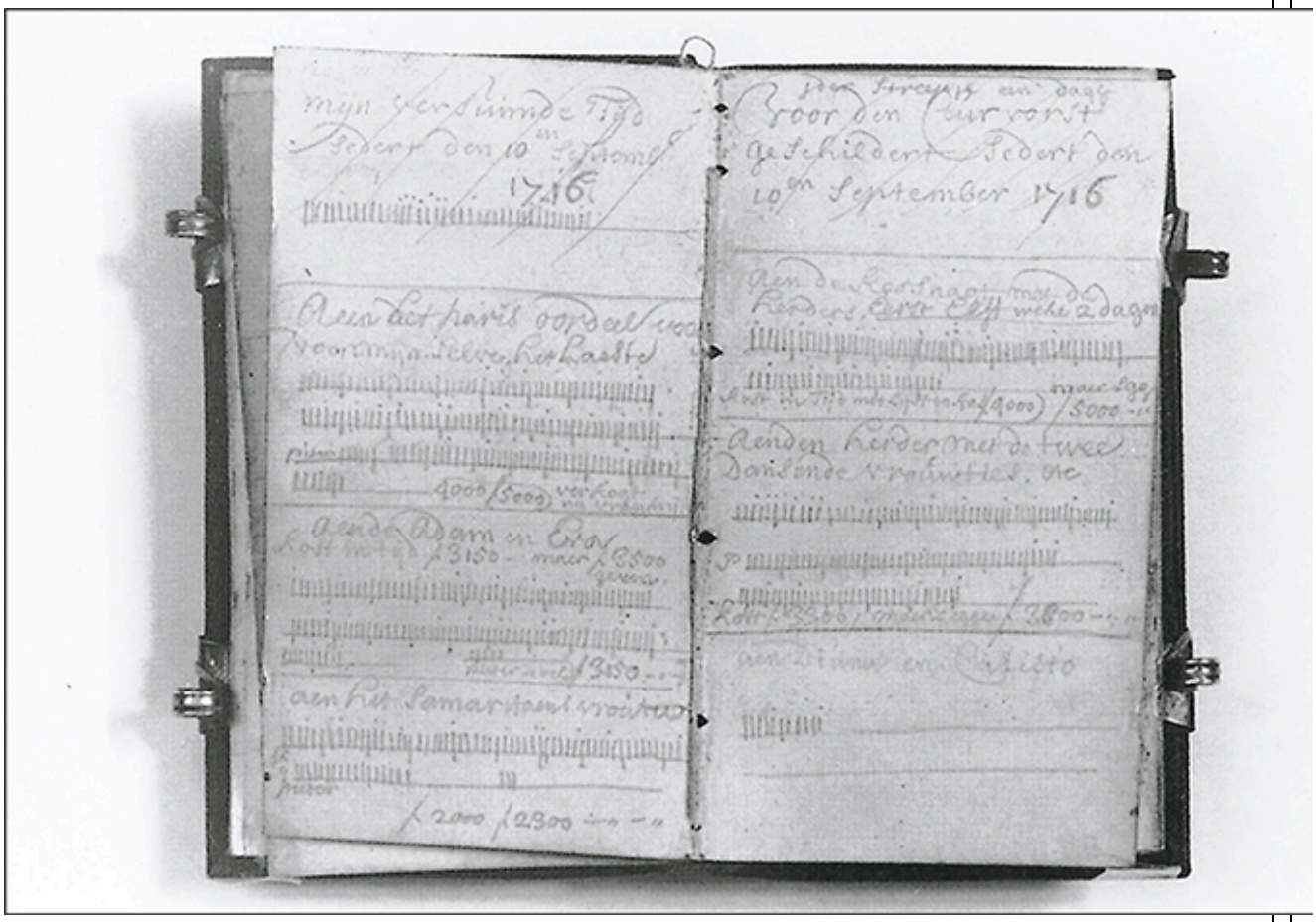


fig. 84Tafelet of Adriaen van der Werff. Preserved among part of the possessions of Adriaen van der Werff in the collection of the Rotterdams Historisch Museum. The writing and

drawing stylus also used to close the book has been lost. 13.5 x 9 cm (compare fig. 85)



▶ Long Description for fig. 85

fig. 85Adriaen van der Werff's tafelet, see fig. 84, opened. The book was used to record the amount of time used to complete a picture and to make a calculation of the amount the painting would cost. Each vertical line indicates one working day; Sundays are omitted. On the two lower entries (for an *Adam and Eve* and a *Woman of Samaria*), the work of van der Werff's brother Pieter, who assisted Adriaen, is recorded as well. The first pages of the booklet have been erased, the traces of earlier inscriptions are still visible

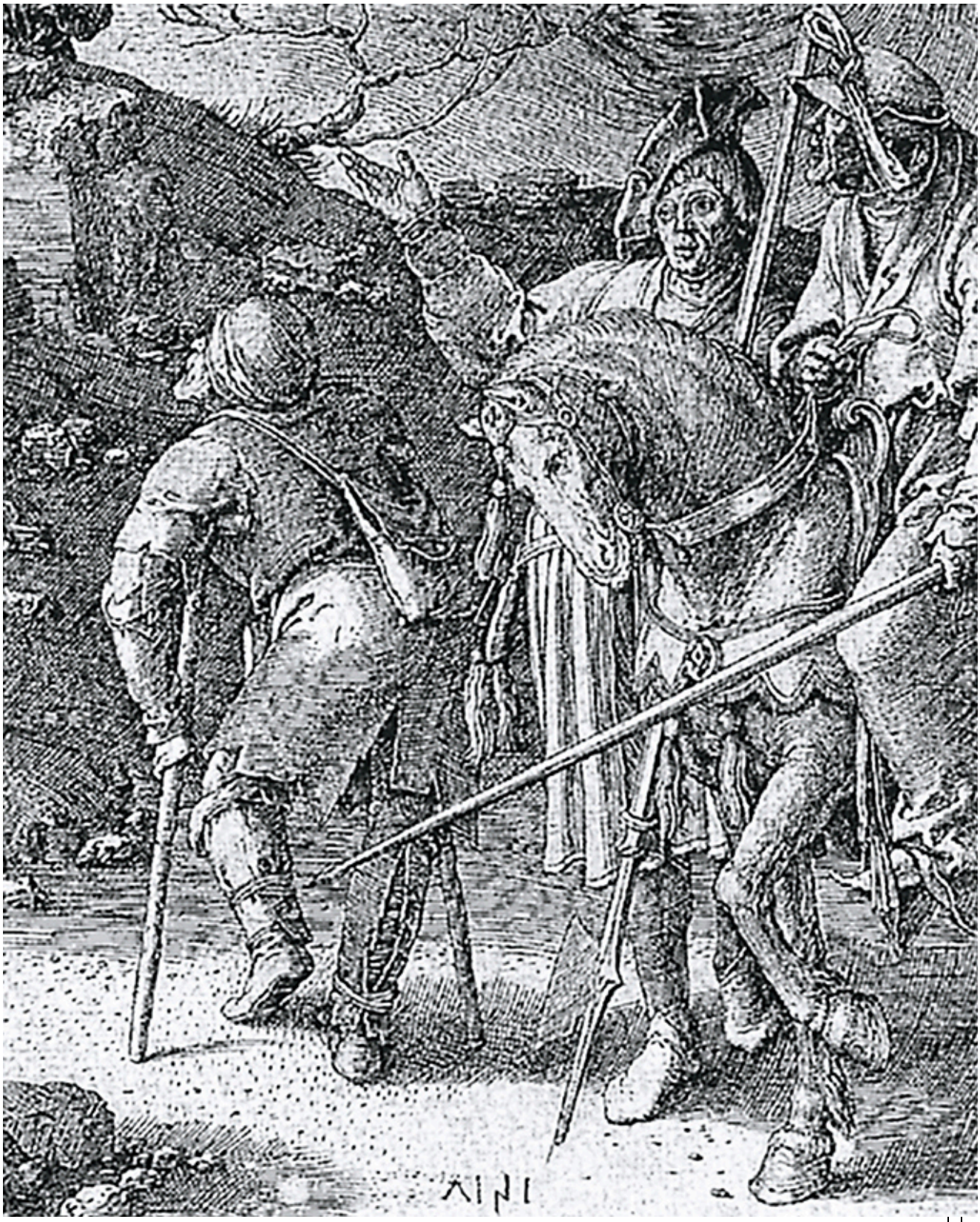


fig. 83Lucas van Leyden, the *Bearing of the Cross* (engraving), showing the detail copied by the draughtsman who used the tafelet of figs. 81, 82

a345

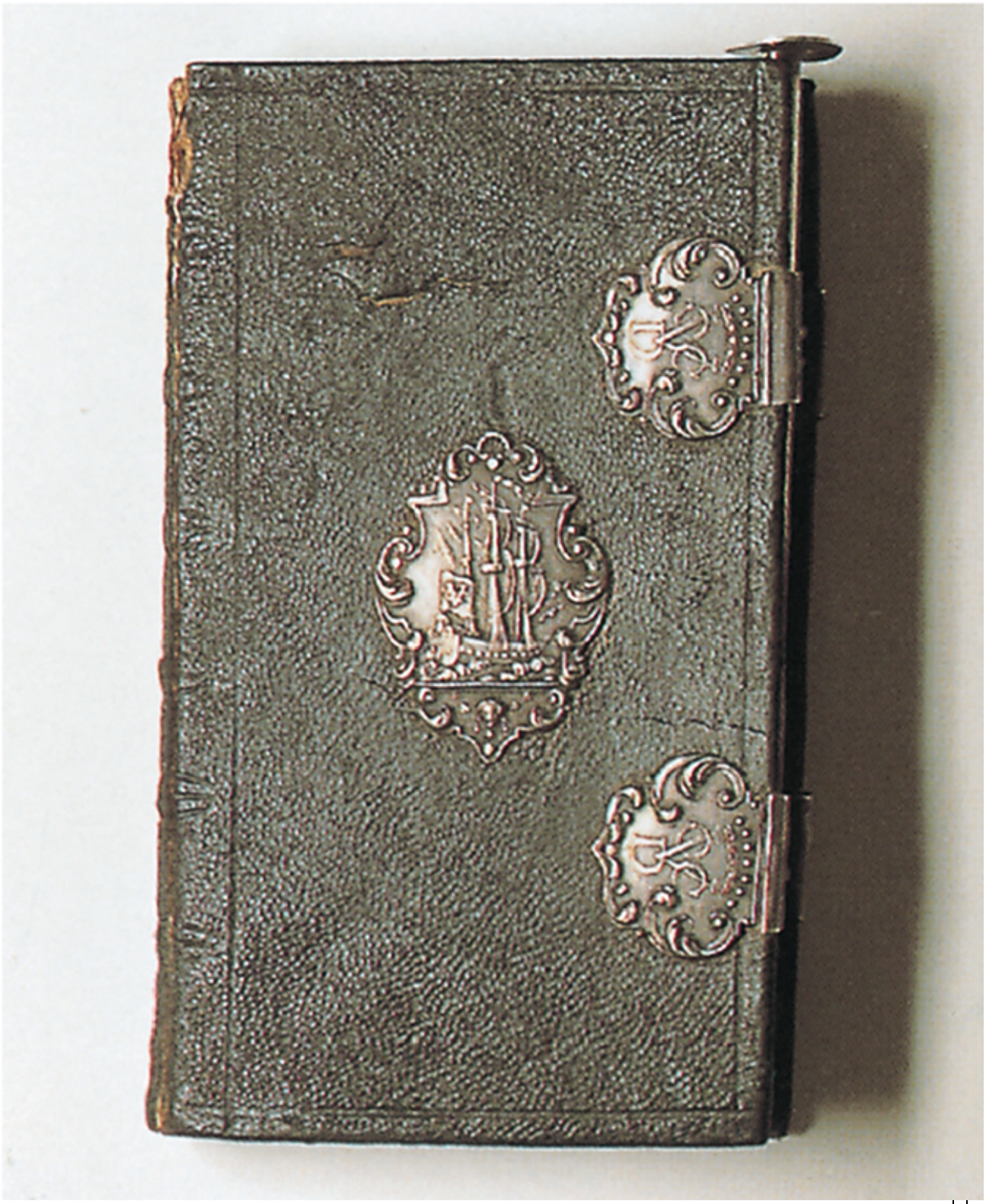


fig. 86Eighteenth-century tafelet given as a present to officials of the V.O.C. (the Dutch United East India Company). Leather with silver clasps, 14 x 8.6 cm. Compare fig. 87. Collection Laurentius

We can assume that everyone, hence every artist, carried a booklet like this about him, possibly in a special pocket, which in one source from 1568 is referred to as a *diefsac* (theft-proof pocket).[40] Nicolaes van Rhenen, a son from the second marriage of the widow of the painter Paulus Potter (1625-1654), told Arnold Houbraken, who wrote Potter's first biography, that

> *he oftentimes heard his Mother say that she never saw her husband [Paulus Potter] idle; that he always carried a little table booklet [tafel boekje] in his pocket, even if he had an hour available to take a walk outside with her, so that if he saw something interesting that he could use for his work, he could sketch that object right away.* [41]

As it happens, a few of these booklets have been preserved without their actual function and nature having been recognized before (figs. 81-87). These booklets are sturdily, even richly bound and evidently prepared to be used for a long time, despite the fact that they contain no more than twelve or fourteen pages. The oldest surviving 'tafelet' or 'tafelboekje', dating from about 1590 (fig. 81), contains exercises, copies after prints, by what seems to be (judging from the rather feeble quality of the drawings), a painter's apprentice (figs. 82, 83).[42] The second 'tafelet' (fig. 84) contains notes for the administration of the painter Adriaen van der Werff (1659-1722) (fig. 85),[43] while the third one (fig. 86) was a present given to officials of the Dutch East India Company (v.o.c.) in the eighteenth century. It contains an almanac printed on paper (fig. 87). After removing these pages at the end of the year, some six pages of prepared vellum were left to be used as a reusable notebook, hence the strong (and, given its function as a present, rich) binding.[44]

fig. 87The tafelet shown in fig. 86, opened on the first pages, printed on paper, containing an almanac, followed by ten pages of prepared vellum which could also be used after the almanac had been removed

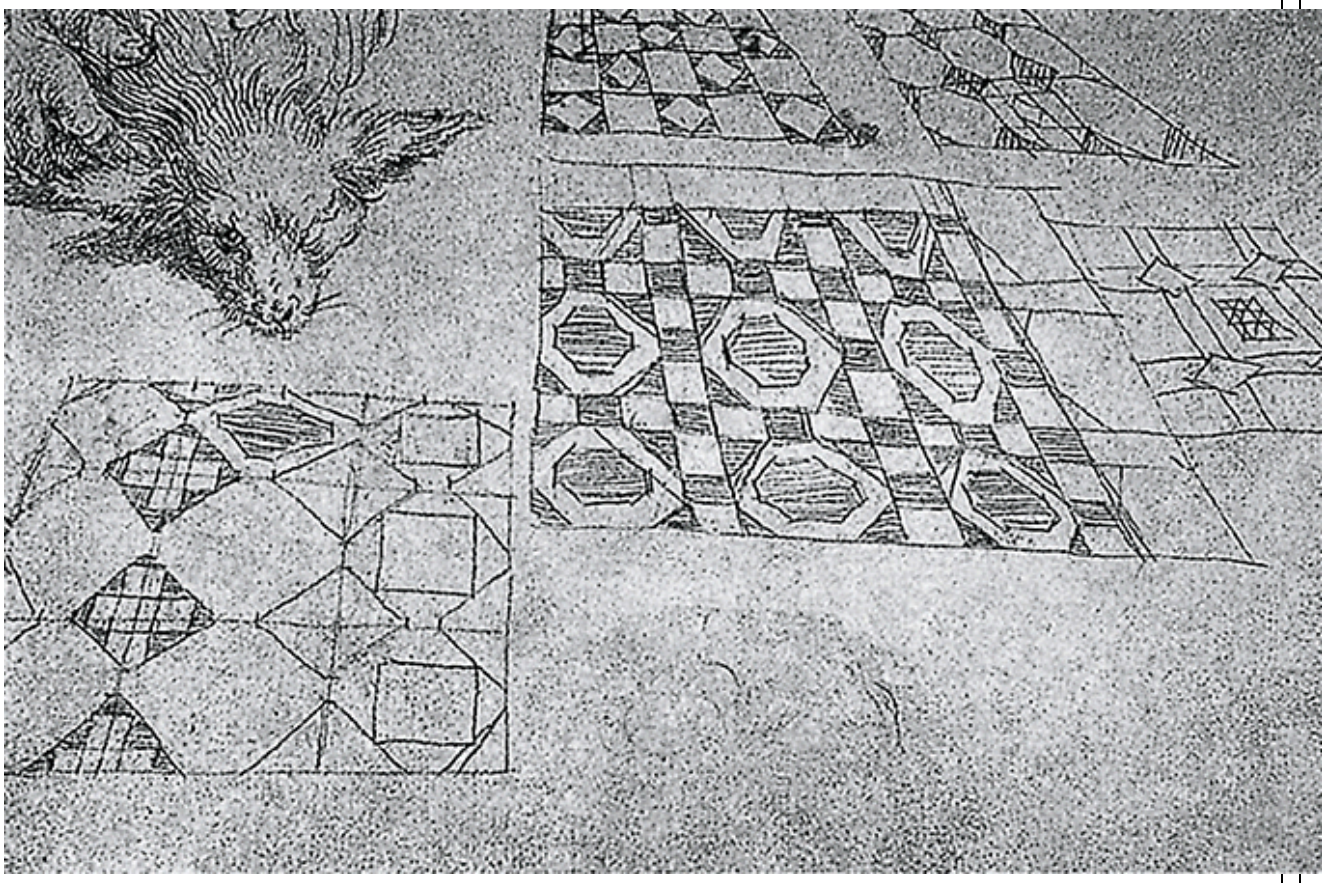
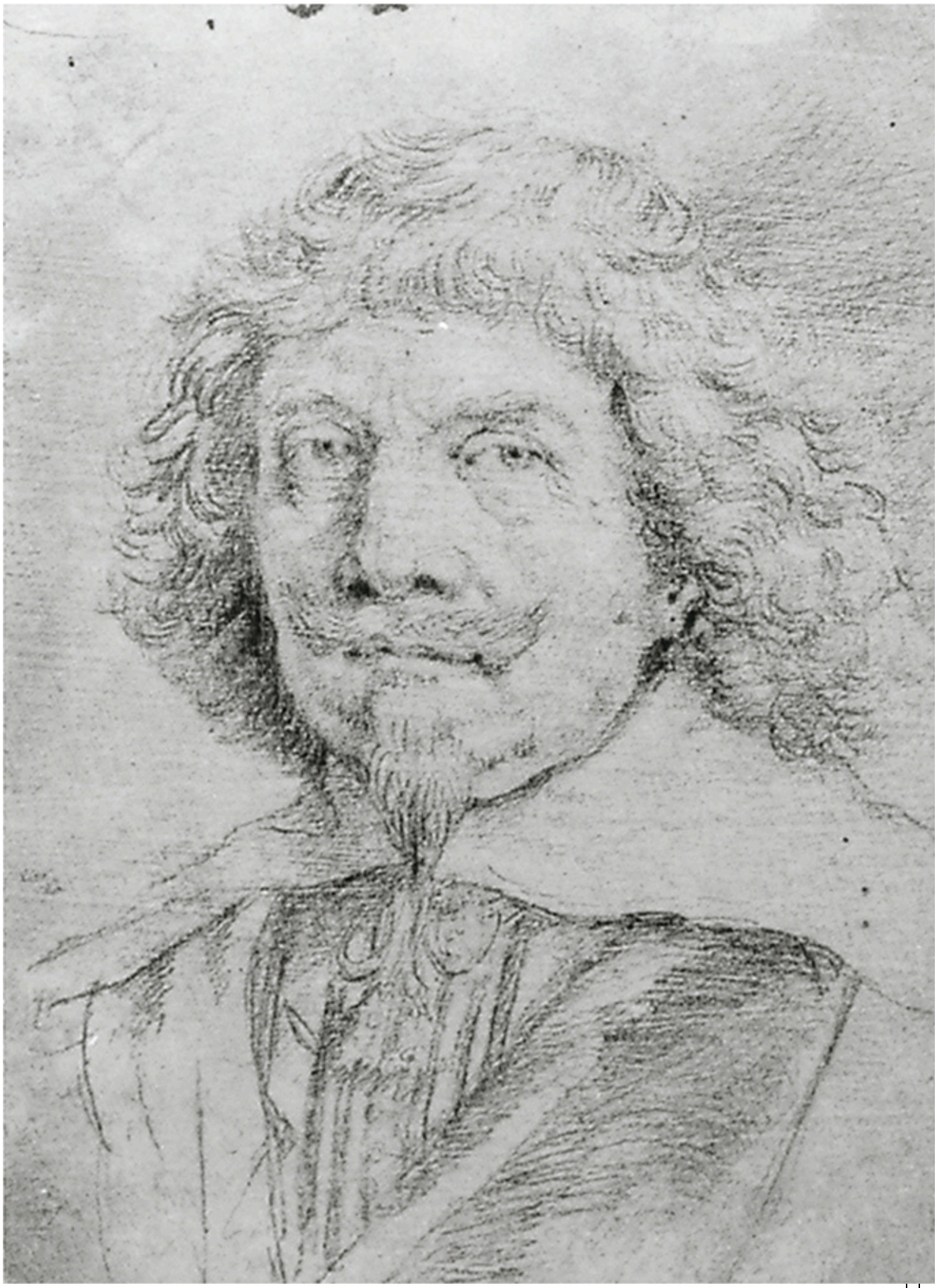
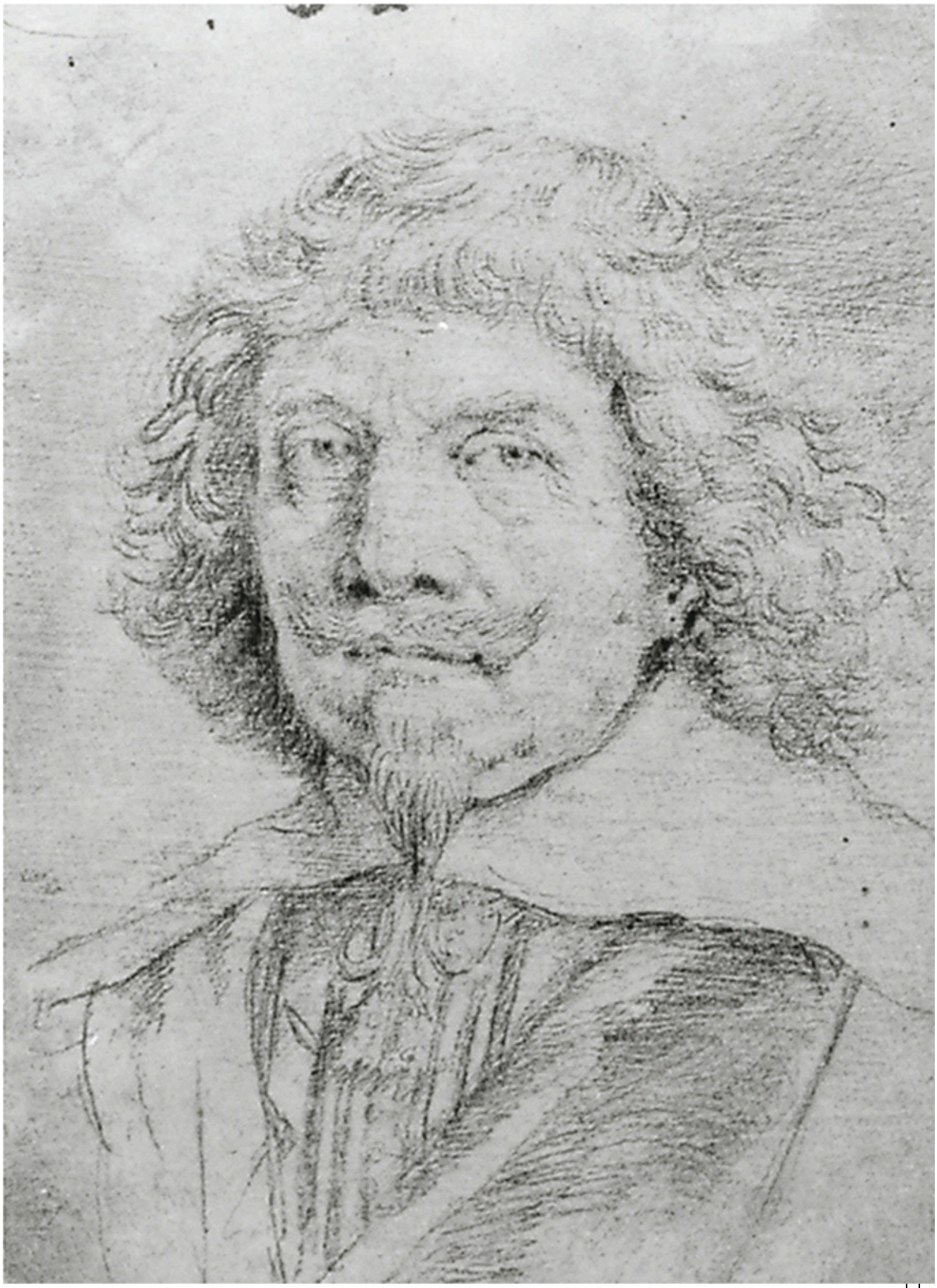


fig. 88Page from a tafelet Albrecht Dürer used from 1520 to 1521. 12.2 x 16.9 cm. The pages of this booklet have been sold separately from the seventeenth century onwards

a354

fig. 89Page of the same booklet as in fig. 88





figs. 90 and 91Recto and verso of the fragment of a page of a tafelet with drawings attributed to Paulus Moreelse, 8.3 x 5.4 cm. London, British Museum. Along the top of the recto and the bottom of the verso chips of the ground have flaked off, revealing fragments of a Medieval manuscript. Apparently such manuscripts were recycled for the production of *tafeletten*. In fig. 91 a correction along the contour of the hair and the collar can be seen, apparently carried out with a little moisture, erasing the metalpoint traces

figs. 92 and 93Two silverpoint drawings from a tafelet with eleven prepared tablets, c. 6 x 9 cm. Attributed to Aegidius or Johannes Tilborch

a358The advantage of the use of metalpoint over drawing or writing materials like chalk or ink is that it does not smudge, it is 'dry', and it leaves a very fine and controlled line. That is the reason why it was also used for very detailed drawings that were meant to be preserved.[45] Another important advantage of metalpoint is that it is a very quick tool. The latter property is the reason why Leonardo da Vinci (1452-1519) advised its use in a passage about *'How to learn the gestures of man'.* After elaborating on the difficulty of rendering these gestures, Leonardo states:

> *For this reason be sure to take with you a little book with pages prepared with bonemeal, and with a silverpoint briefly note the gestures of the bystanders and how they are grouped. This will teach you how to compose narrative paintings.*

Leonardo then adds,

> *When your book is full, put it aside and keep it for later use, then take another book and continue as before.*[46]

The fact that the pages of such booklets were made fit to be reused must have been the reason why few of such drawings by Leonardo and so few traces in general of this phenomenon have survived, although enough to confirm that it must have been widely used (figs. 88-93), and well into the nineteenth century (fig. 94).[47]

fig. 94*Portrait of Johannes Brahms* by Jean Joseph Laurens (of Montpellier). 1852, silverpoint on prepared vellum. Berlin, Archiv für Kunst und Geschichte (see note 47)

The discovery of the 'tafelet' as a virtually forgotten but much used implement, as a self-evident part of the daily life of the artist, as well as of many others, may force us to reconsider our image of artistic practices in some respects. This 'black hole' in art history must have swallowed up millions of irretrievably lost drawings, which would have given insight into possibly unknown aspects of the artist's working habits. First of all, the numerous exercises by young artists, either on wooden or paper boards or on the pages of parchment booklets (see figs. 57-58). Rembrandt too must have made such exercises in great quantities. That offers the best explanation for the fact that in 1631, at the beginning of his Amsterdam period, he suddenly emerges as a full-blown portrait painter. But also preparatory sketches for some of Frans Hals' portraits, and Vermeer's compositional explorations – if they ever existed – may have disappeared forever as a result of constant reuse and the final discarding of their 'tafeletten'.

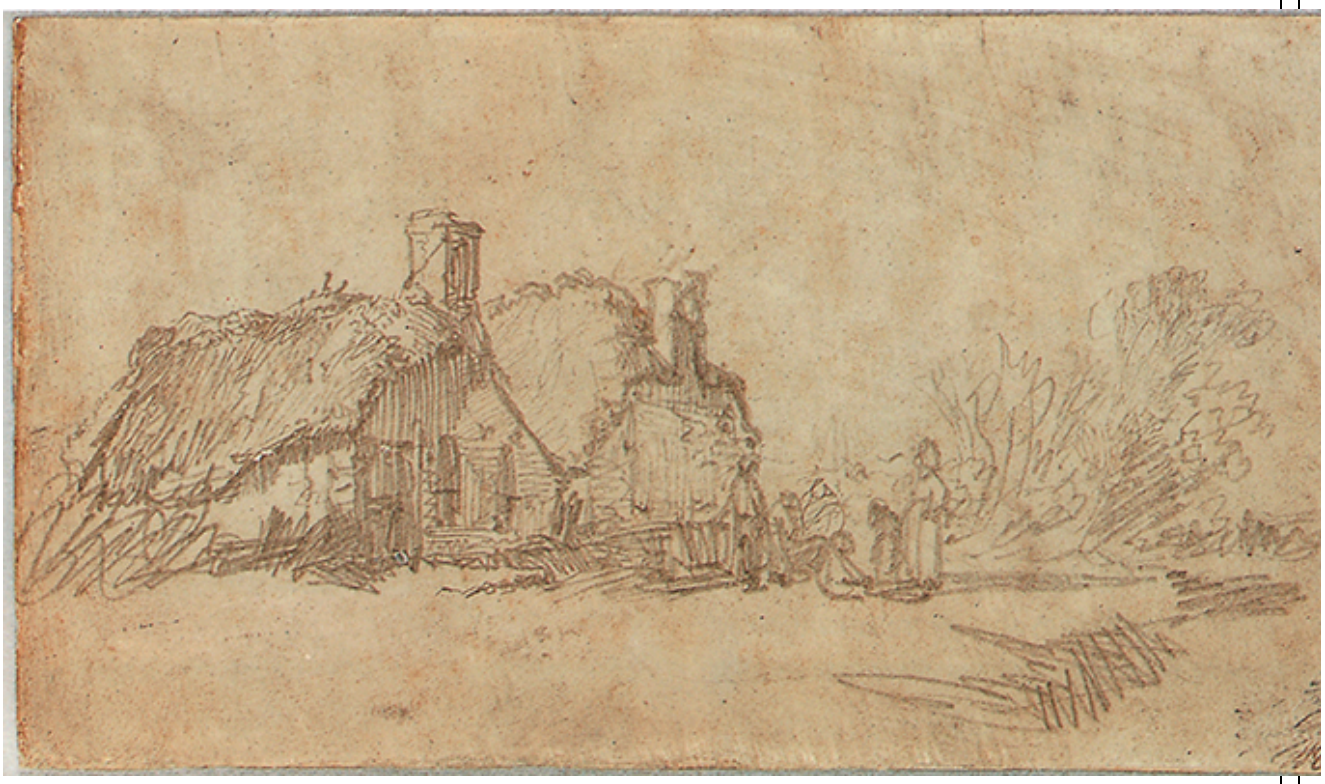


fig. 95Rembrandt, *Landscape with Two Cottages Thatched with Straw*, c. 1636. Silverpoint on prepared vellum, 10.9 x 19.2 cm. Berlin, Kupferstichkabinett, Staatliche Museen Preussischer Kulturbesitz. This leaf has nearly the same size as the one on which Rembrandt made his drawing of Saskia (see fig. 47) and may thus stem from the same (oblong) 'tafelet'

fig. 96Verso of fig. 95. Rembrandt, *Landscape with a Man Standing by a Road*. Silverpoint on prepared vellum. Berlin, Kupferstichkabinett, Staatliche Museen Preussischer Kulturbesitz

a365Of Rembrandt's 'tafelet' – or 'tafeletten' – only three pages or fragments of pages have survived: in the first place the lovely portrait of Saskia (see fig. 47). Marieke de Winkel has drawn attention to the fact that straw hats, as worn by Saskia on the drawing, were only used on walks outside.[48] In a sense Rembrandt indeed made this drawing 'on the road'. It is generally believed that the drawing was made when he came to discuss his marriage with Saskia's guardian in Sint-Annaparochie in Friesland, where Saskia lived.[49] After the engagement Rembrandt returned to Amsterdam leaving Saskia in Sint-Annaparochie where eventually the marriage took place a year later.

fig. 97Rembrandt, *Cottages before a Stormy Sky*, c. 1641. Pen and washes in bistre and Indian ink, 18.2 x 24.5 cm. Vienna, Albertina

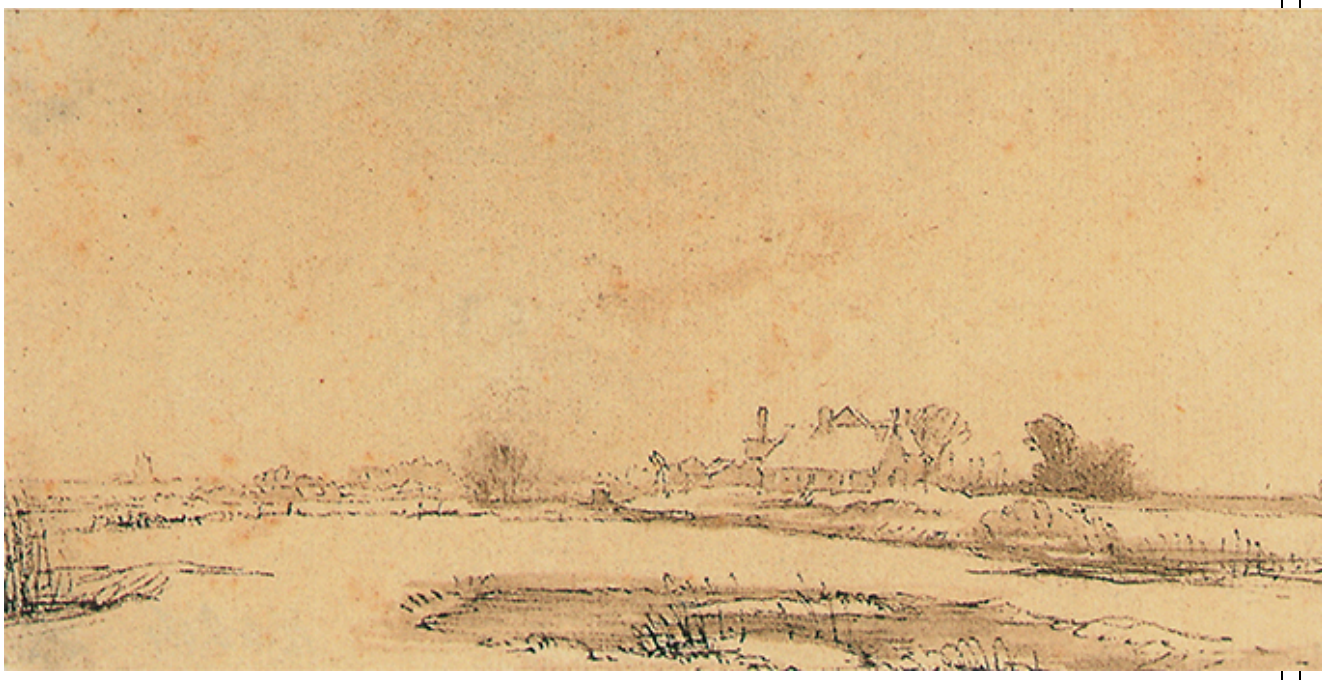


fig. 98Rembrandt, *Landscape with a Farmstead*, c. 1649-50. Pen and bistre, wash, on yellowish paper, 7 x 15 cm. Chatsworth Settlement

a370Could the drawing have been made in preparation of an etching or a painting, to be executed in the studio back in Amsterdam? The great care devoted to Saskia's features and posture – the roughness of the rest of the drawing (see fig. 47), brings to mind Hendrik Goltzius' silverpoint portraits of which we know with certainty that they were of a preliminary nature (see figs. 75, 79).

As to Rembrandt's other silverpoint drawings (see figs. 48, 49, 95, 96), those with landscapes confirm that he, like Paulus Potter and so many others, must have carried a 'tafelet' with him. As discussed at the beginning of this chapter, the landscape elements depicted on these sheets are unusually rough notations, lacking the compositional care observed in Rembrandt's landscape drawings on paper and his etchings with landscapes (figs. 97-99). Leaving aside the problem of the dating of these silverpoint drawings, [50] the question is therefore justified whether the landscape drawings on paper, as well as the etchings, were not in many cases made in the studio on the basis of such crude silverpoint notations in his 'tafelet', which, meanwhile for obvious reasons, have been lost. As to the silverpoint drawing with the heads on the other side of one of the landscapes (see fig. 49), the question of the preliminary nature of this group of sketches needs further investigation. Such groups of heads are also found among Rembrandt's etchings.[51]

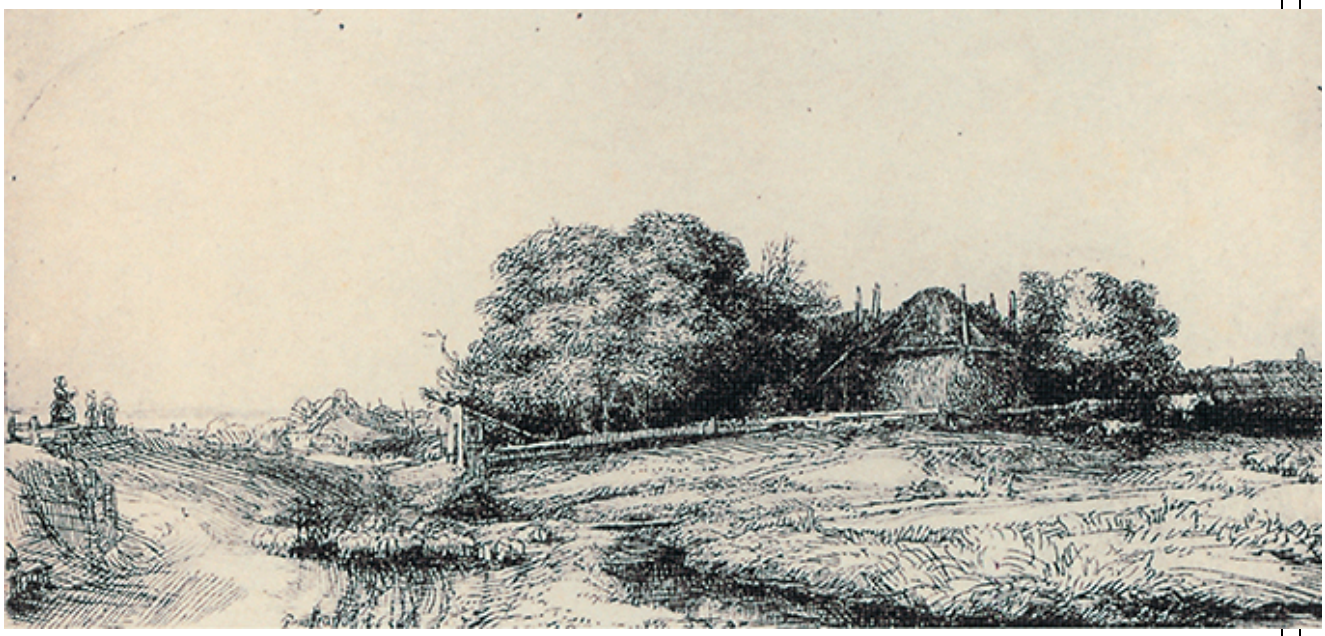


fig. 99Rembrandt, *Landscape*, 1652. Etching, 8.6 x 18.5 cm

a374

The existence of the 'tafelet' may have had its bearings on the status of drawings on paper in many different ways. These may have been meant to have a more definitive character, as documentation, for instance, which, as we know, Rembrandt used to file by subject. Part of his drawings on paper were used, either by Rembrandt himself or by members of his studio, as sources for certain motifs to be incorporated into more ambitious compositions (figs. 100, 101).[52] There is on the other side ample evidence that part of Rembrandt's scribbles one would have expected to be made in a 'tafelet' were on paper – often on the backs of other drawings. But it is exactly one of these little drawings (see fig.

114) which reminds us of the possibility that Rembrandt's first designs for his compositions, of which hardly any have survived, could have been made in his 'tafelet' and eventually been lost.[53] I doubt that this was the case. In the next chapter, seventeenth-century ideas – and possibly Rembrandt's own ideas – about the birth of the pictorial idea will be discussed in more detail.

fig. 100Rembrandt, *Watchdog Sleeping in his Kennel.* Drawing in red and bistre and ink, 13 x 15.3 cm. Boston, Museum of Fine Arts, detail

a378

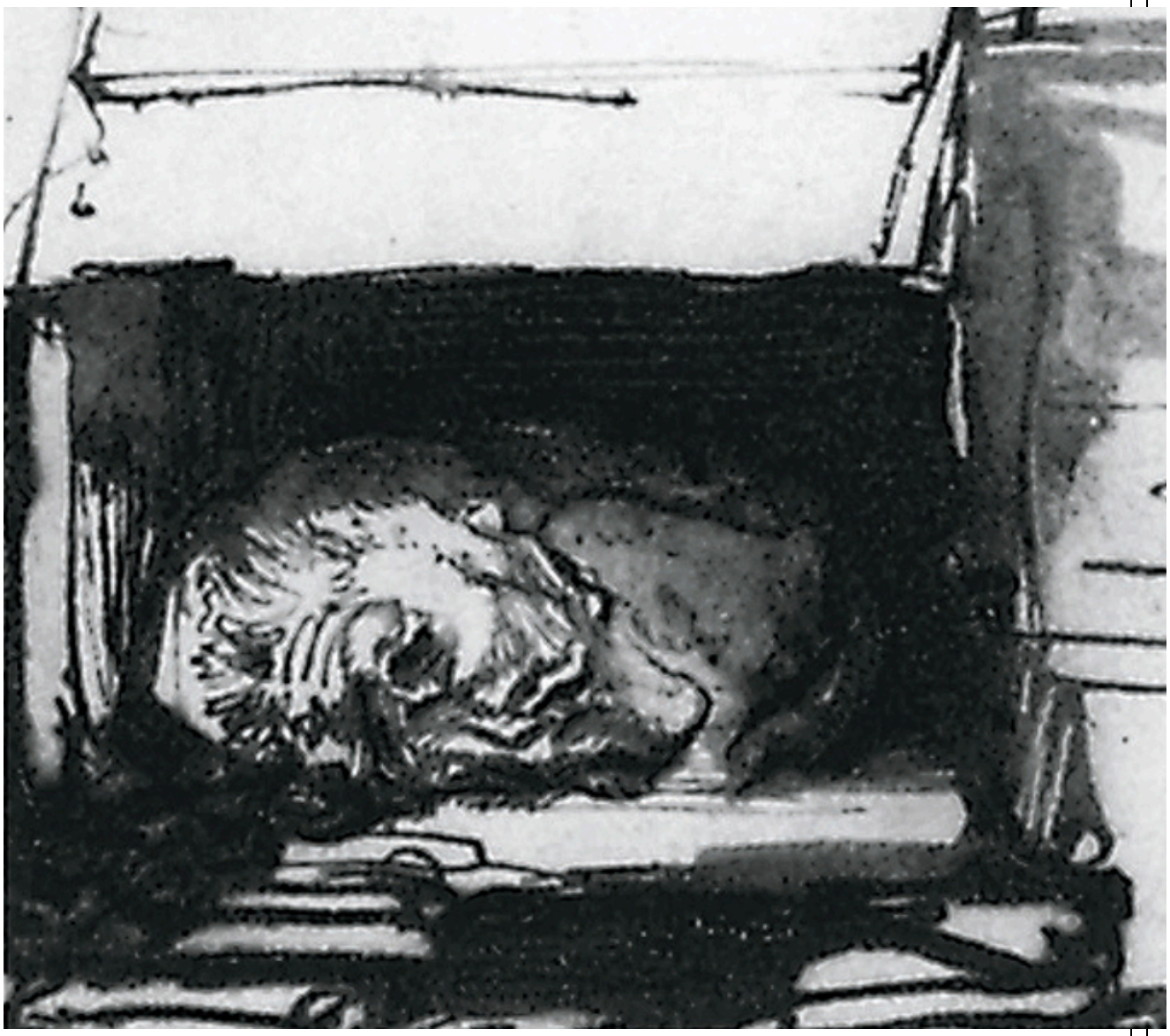


fig. 101Rembrandt, *Joseph Telling his Dreams*. Grisaille on paper, 55.8 x 38.7 cm. Amsterdam, Rijksmuseum. The sleeping dog in the lower right is based on the drawing reproduced in fig. 100

[h1] IV The Creation of the Pictorial Idea

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a381

a382The way in which the first idea of a painting arises, its conception, is as much a mystery in the case of Rembrandt as with many other artists. Indeed, we are touching here on one of the essential secrets of art. It is, of course, not so much a question of the choice of subject to represent (which may, after all, be decided by a patron), it is especially the form, in the widest sense, in which that subject is cast, with which the creative process is concerned. Of the hundreds of Rembrandt's drawings that have come down to us, many deal with themes that reappear in his paintings. The obvious assumption therefore would be that his ideas for paintings (and for the more ambitious etchings) were developed while drawing. That, however, is questionable. What emerges from closer analysis of Rembrandt's drawings is that almost all of those formerly associated with the conception of his paintings had in fact a rather different function.

[h2] On the Function of Drawings

In a number of cases, it has been established that the drawing did not precede the painting, but was made when Rembrandt was changing the composition of the painting in order to try out a new solution (figs. 103106). In several other cases, he copied his own paintings in rapid sketches that look like preliminary sketches, but which in fact served in designing a frame (figs. 107, 108; see also figs. 274, 276). The several drawings which were earlier considered as studies for portraits are in all probability a kind of vidimus, a sketch made for the person commissioning the portrait to demonstrate what the painting would look like (figs. 109, 110). In many other cases, sketches previously thought to be studies for paintings have turned out to be copies of Rembrandt's paintings that have been drawn by other hands in his workshop (figs. 111, 112 a, b, c). Sometimes it is highly tempting to see preliminary studies in such drawings because in certain respects they differ from the painting, as though they represented an earlier stage in its process of creation. In many cases, however, this kind of deviation between copy and original is now explicable on the basis of X-radiographs of the painting. It turns out that the copy was drawn from Rembrandt's original painting before it had acquired its definitive form (see figs. 312, 313). Groups of drawings of the same subject which were formerly considered to be explorations by Rembrandt of a particular theme are now thought to be the work of pupils, drawn as exercises in the course of their training or as such exercises by Rembrandt himself. Hoogstraten's advice, *'Go ahead bravely and sacrifice your paper on it, continuous exercise might make you abundantly rich in 'ordonnantie [arrangement of figures in a composition]'*,[1] indicates that practising compositional solutions must have been one of the on-going activities in the studio, both by the master and his pupils.

fig. 102Rembrandt, The Artist in his Studio, 1629. Panel, 25.1 x 31.9 cm. Boston, Museum of Fine Arts

fig. 103 Rembrandt, *Judas Repentant, Returning the Pieces of* Silver*, 1629. Panel, 79 x 102.3 cm. England, private collection.*

a387

fig. 104Rembrandt, Study in pen and wash, presumably done in preparation of the painting's second state, c. 11.5 x 14.5 cm. Formerly Vienna, Graphische Sammlung Albertina. This drawing must have been made during a stage of the work on the painting in fig. 103, when Rembrandt was unable to find a satisfying solution for compositional, narrative or lighting problems (see figs. 105, 106)

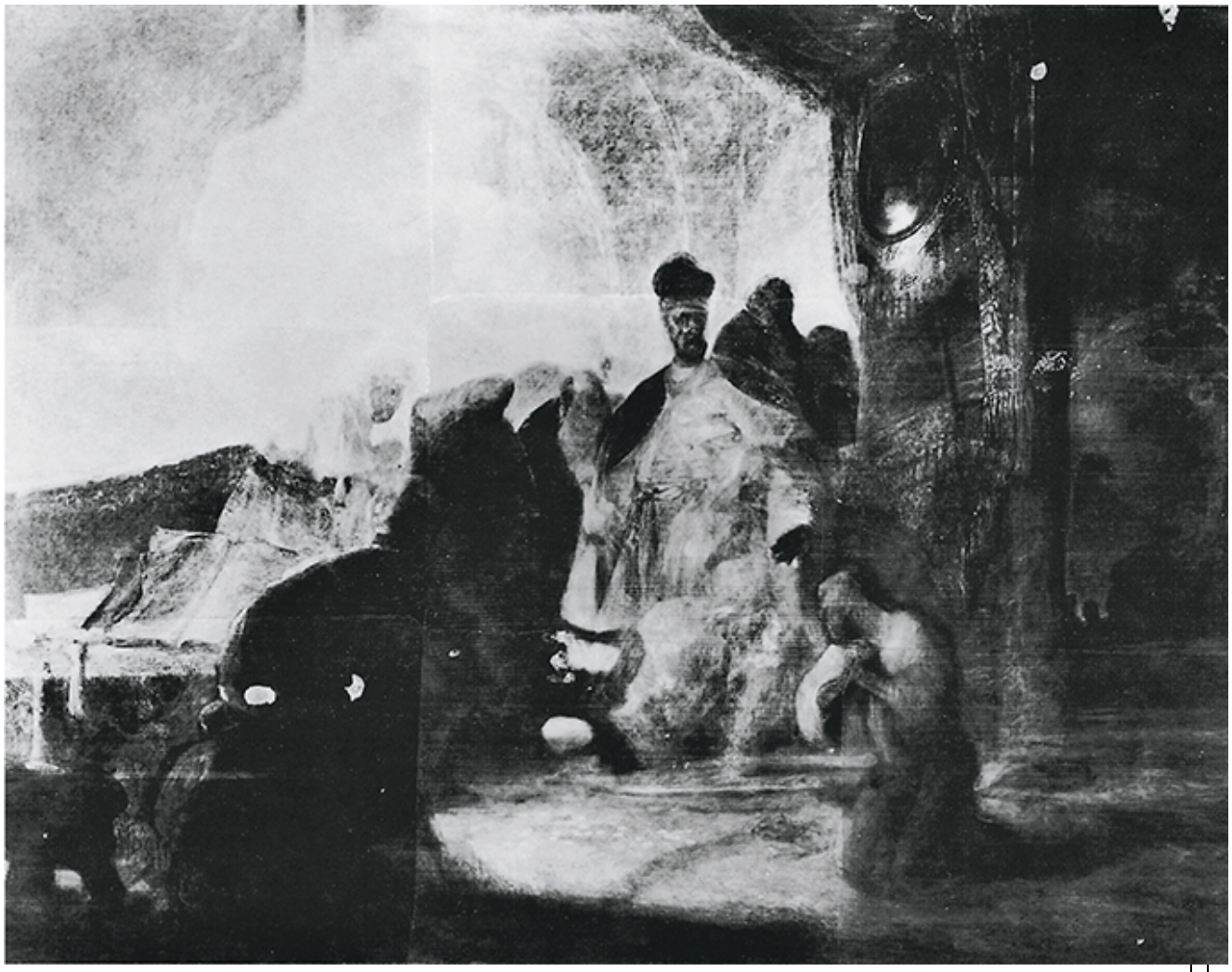


fig. 105X-ray of fig. 103

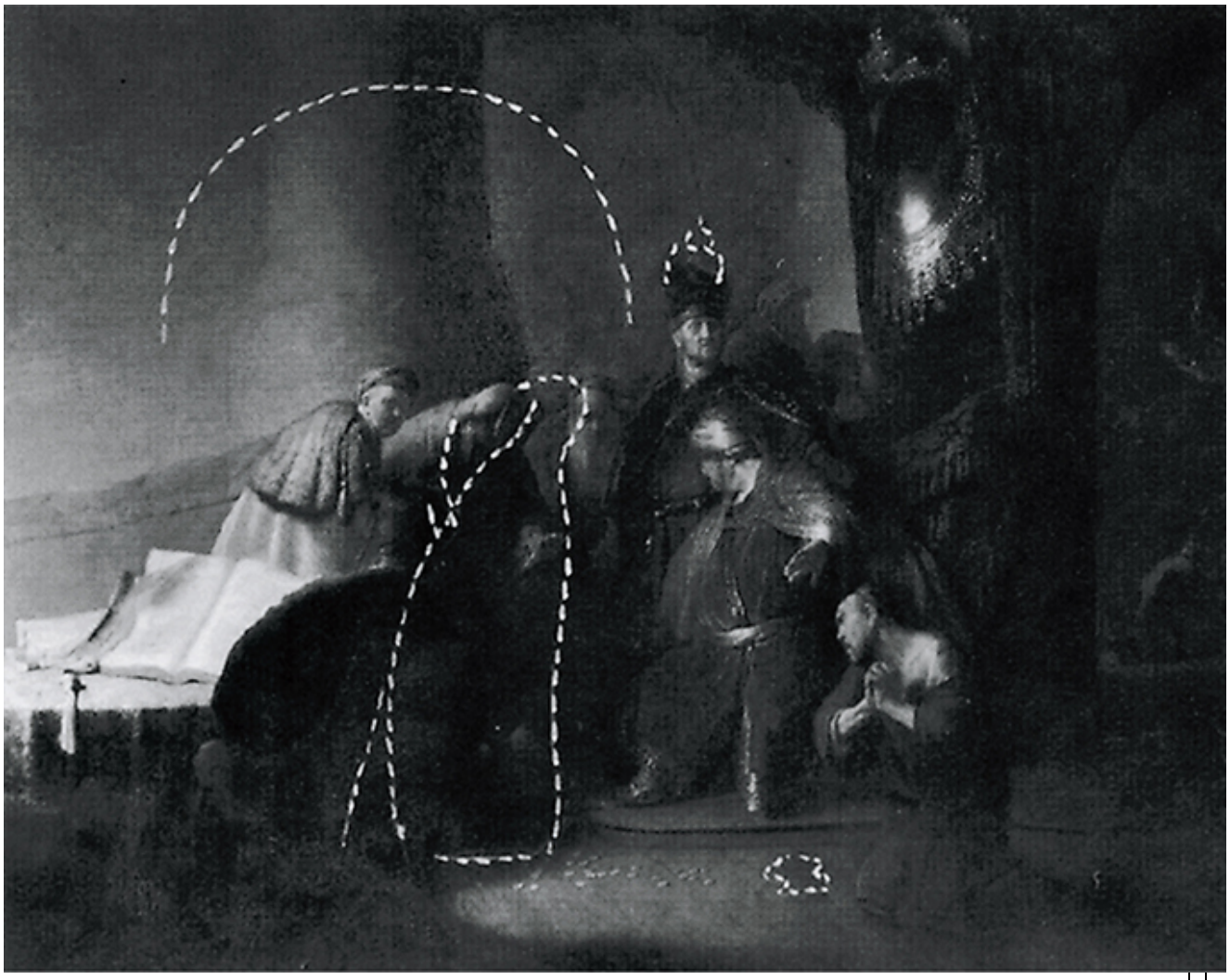


fig. 106The changes in the painting are visible in the X-ray (fig. 105). They also show at the paint surface in relief and in locally occurring areas with shrinkage cracks. Underlying forms visible to the naked eye are marked in white

a391

fig. 107 Rembrandt, John the Baptist Preaching, 1634/35. Canvas on panel, 62.7 x 81.1 cm. Berlin, Staatliche Museen zu Berlin, Preussischer Kulturbesitz (see also fig. 133)

a393

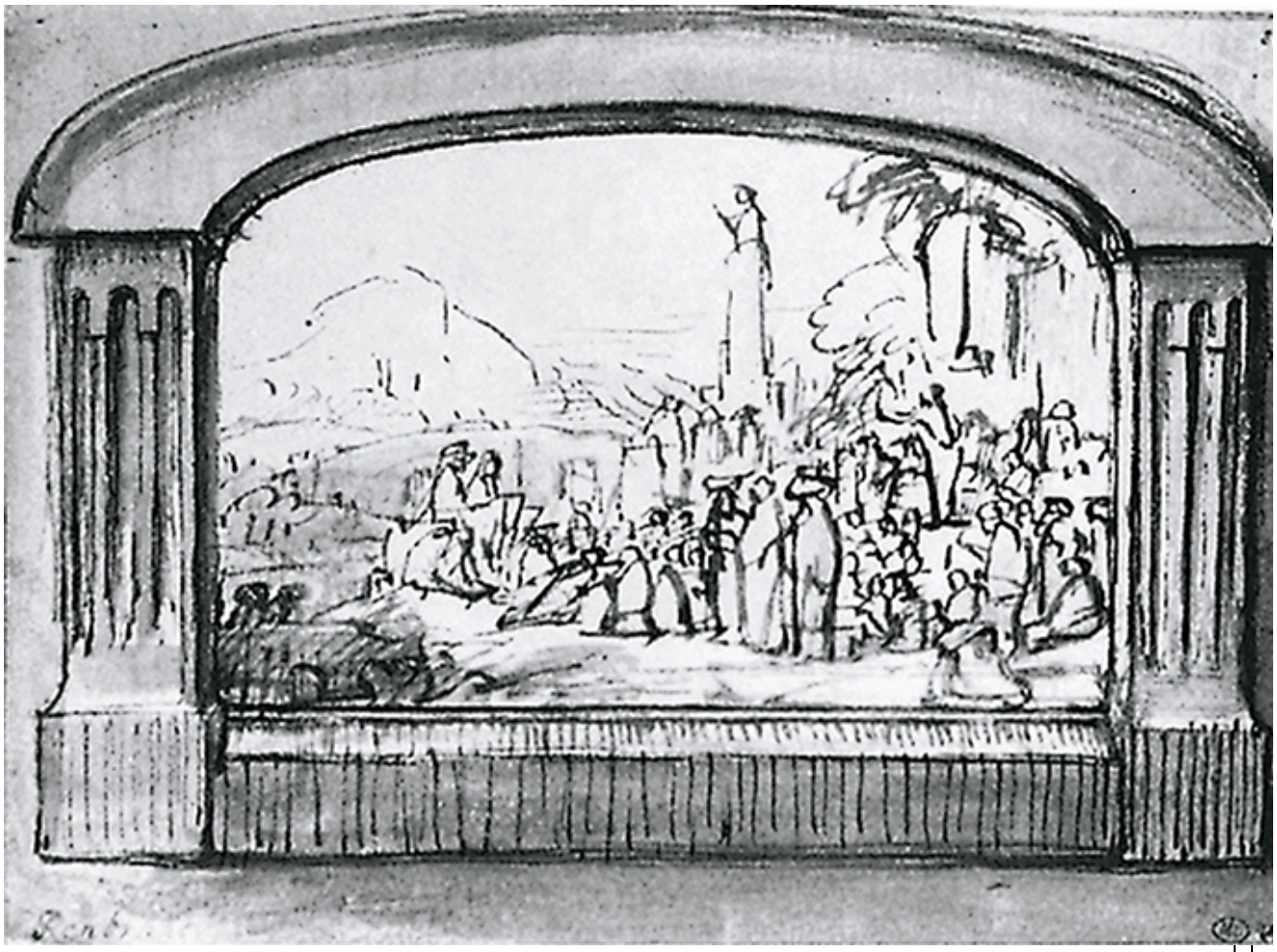


fig. 108Rembrandt, Pen and wash drawing of the painting (see fig. 107) in a frame, most likely intended as a proposal for the framing of the picture; c. 1650. 14.5 x 20.4 cm. Paris, Louvre, Département des arts graphiques (L. Bonnat Bequest)

fig. 109 Rembrandt, *Portrait of a Young Woman, probably Maria Trip*, 1639. Poplar panel, 107 x 82 cm. *Amsterdam, Rijksmuseum. On loan from the Family van Weedestichting.*
a396

fig. 110Rembrandt, Sketch related to fig. 109; pen, red chalk, wash, 16 x 12.9 cm. London, The British Museum

fig. 111 Rembrandt, The Adoration of the Shepherds, 1646. Canvas, rounded at the top, 97 x 71 cm. Munich, Alte Pinakothek

a399

fig. 112aCopy after The Adoration of the Shepherds, pen and bistre, 10 x 8.4 cm. Cambridge, Fitzwilliam Museum (see fig. 111)

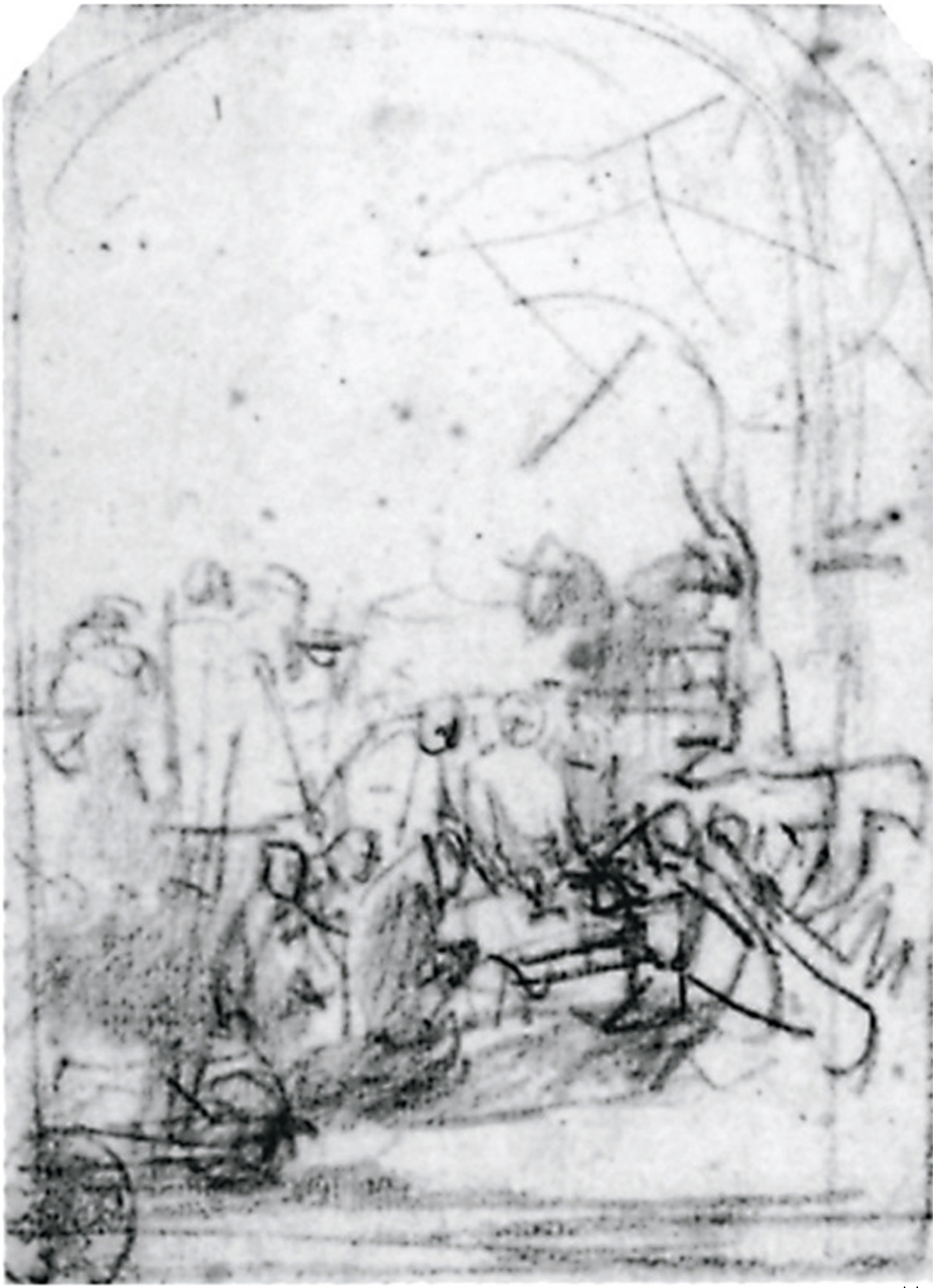


fig. 112bCopy after The Adoration of the Shepherds. Black chalk, 12.6 x 9.2 cm. Munich, Graphische Sammlung (see fig. 111)

fig. 112cCopy after The Adoration of the Shepherds. Black chalk, 13 x 9.8 cm. Munich, Graphische Sammlung (see fig. 111)

The number of drawings which might tentatively be considered Rembrandt's first sketch of an idea for a painting or etching is, in any case, so small that they offer no real clue to his manner of conceiving compositions (figs. 113, 114).

fig. 113 Rembrandt, Joseph Telling his Dreams, 1638, etching second state, 11 x 8.2 cm. Amsterdam, Rijksprentenkabinet. Reproduced in reverse

a404

fig. 114Rembrandt, Joseph Telling his Dreams, red chalk, 18 x 12.5 cm. Rotterdam, Museum Boij- mans Van Beuningen. Sketch for the etching (see fig. 113) done on the back of a drawing in pen, which locally shines through

[h2] The Painting Contest

The problem of artistic conception was already a matter of discussion in Rembrandt's own time, while the roots of ideas then current are in part to be found in classical antiquity. One of the most interesting sources for an understanding of seventeenthcentury thinking about this issue is a detailed description of a painting contest. This account can be found in Hoogstraten's *Inleyding tot de hooge schoole der schilderkonst* from 1678.[2] The anecdote of the painting contest was repeated almost word for word forty years later by Arnold Houbraken in his *Groote Schouburgh*.[3] The description of the event, which theoretically Rembrandt himself could have witnessed, would appear to give an exceptionally vivid glimpse into the Dutch – presumably Leiden – art scene around 1630, and may well contain an important clue as to Rembrandt's own way of conceiving a composition. I shall quote the passage in full, interrupting where necessary to provide information on the painters involved in the contest. Hoogstraten describes the competition, which was attended by art lovers and connoisseurs, as follows:

> *The first of these painters, Knibbergen by name, put a rather large canvas on his easel and, hand and brush doing his bidding, began at once dapper to write, that is, to paint in such an accomplished fashion that everything he put on was at once finished; for sky, distance, rocks, trees and rushing waterfalls all flew from his brush like the letters from the pen of a scribe. He applied his foliage and his sinuous greenery in a fixed manner: the drifts of clouds seem to glide from his hand, the rocky cliffs, the rough ground were as though born from his paints.*

It is known that François Knibbergen (1597-1665) returned some time before 1629 to settle in The Hague after a stay in Italy. As a landscape painter he was influenced by Jan van Goyen – one of the other two contestants in this anecdote. What is significant for an understanding of the passage quoted above is that Knibbergen specialized in rather uniform landscapes with waterfalls which, as the text implies, were routinely painted (fig. 115).

fig. 115 Knibbergen, Mountainous Landscape, (undated). Canvas, 98 x 150 cm. Netherlands Institute for Cultural Heritage

a410

a411a412Hoogstraten's text continues:

Beside him sat Jan van Goyen, who went about his work in an entirely different way; by covering his whole panel at once, here light, there dark more or less like a variegated agate or marbled paper, he succeeded in creating various amusing drolleries, almost effortlessly it would seem, with delicate touches; so that yonder appeared a pleasant prospect, adorned with peasant villages, here could be seen an old stronghold with gateway and landing stage and, reflected in the lapping water, ships and barges laden with cargoes or passengers, embarking or disembarking. In short, his eye, as though looking for forms that lay hidden in a chaos of paint, steered his hand and mind in true wise so that one saw a complete painting before one realized what he intended [fig. 116].

fig. 116Jan van Goyen, River View with the Ruin of the Church of Warmond, 164(4). Panel, 40 x 61 cm. Private collection (with thanks to Hoogsteder & Hoogsteder, The Hague). The subject of Van Goyen's painting as described by Hoogstraten (see p. 84) does not occur in his oeuvre before c. 1635

Jan van Goyen (1596-1656) worked in Leiden up to 1631/2, when he is thought to have moved to The Hague. Just as he influenced Knibbergen, he in turn had probably been spurred to the creation of his atmospheric landscapes by the example of our third participant in the painting competition, the marine painter Jan Porcellis (1584-1632). Porcellis transformed the traditional seascape, which were in fact 'ship's portraits', into the atmospheric sea- or riverscape with anonymous fishing boats (fig. 117). Porcellis and Van Goyen were certainly acquainted with each other. In 1629, Porcellis bought a house from Van Goyen in Leiden, so it seems quite possible that he was living in Leiden at the time. He was definitely living in The Hague in 1630, and subsequently in Zoeterwoude, where he died in 1632. Although Porcellis' way of working is the last to be described in Hoog- straten's text, this description provides the core of the story and the central point of significance for the present chapter.

fig. 117Jan Porcellis, Riverscape, panel, 58 x 80 cm. Rotterdam, Museum Boijmans Van Beuningen

> *The third was our Porcellis, the great Raphael of Sea Painters.*
>
> *But art lovers had almost given up hope when they saw how slowly he handled his brushes; it seemed at first even that he was deliberately wasting time, or knew not how he should begin. And the reason for this was that he was first forming in his imagination the whole conception of his work; he was first making the painting in his mind before he put his brush into the paint. But the outcome showed that this was the right way to proceed; for though he persisted in his slowness, he knew what he was about, and by the evening had completed his piece as well as his competitors; and though Knipbergen's [sic] piece was bigger, and Van Goyen's was filled with more detail, Porcellis had in his well-chosen naturalness and in the art something extraordinary which one never senses in paintings that flow easily from the hand [Knibbergen], or by searching and finding in random images [Van Goyen]. In the end, this piece [by Porcellis] was prized above the other two by the connoisseurs, though neither of the other two, in their own way, were to be dismissed.*

We get the feeling of listening to an eyewitness report from a contemporary. One sees three painters at work who could well have met each other in Leiden or The Hague between 1629 and 1632. One could even imagine Rembrandt among the on- looking crowd. But did this incident ever really take place? Hoogstraten was born in Dordrecht in 1627 and thus

could not have been present. But why could Hoogstraten not have heard it from others, possibly even from his teacher Rembrandt himself who, a415 after all, lived and worked in Leiden until 1631? And why, in fact, should I question the authenticity of this story at all?

Earlier, one would gratefully have accepted such anecdotes at face value, as glimpses into the daily lives of Dutch seventeenth-century painters. We have since learned, however, to doubt the reliability of such artists' anecdotes. Ernst Kris and Otto Kurz have demonstrated how, since classical antiquity, the same motifs keep surfacing in artists' anecdotes. In their book on the subject, significantly titled Die Legende vom Künstler (The legend of the artist), Kris and Kurz show convincingly how particular anecdotes would time and again be 'worked' into other biographies to illustrate vividly the characteristics held to typify a particular type of artist; these are so-called topoi.[4] The use of a topos, or recurrent formula, as a rhetorical device derives from classical antiquity. The question the historian must always ask himself is whether a passage from a historical source is deliberately worked into the text as a topos. Consequently, whenever it turns out that there is good reason to assume that a particular passage is in fact a topos, the more urgent question then arises of whether the information contained in the text is worthless as historical data.

In the case of the anecdote of the competition related by Hoogstraten (and subsequently by Houbraken), there seems to be every reason to suspect that a series of topoi have been strung together which have to do with the artist's special skills.

There is, for example, the topos of the incredible speed with which some painters can work.[5] This was, for Hoogstraten, the immediate cause for telling the anecdote quoted above. Another topical motif is the contest between artists, whereby the one achieving the most convincingly realistic representation is declared the winner. It is well known that such stories were already told about the great Greek painters of antiq- uity.[6] Another motif found in Pliny and which resurfaces later in the writings of Leonardo da Vinci is the inspiration painters are able to draw from accidental forms.[7] The description of Van Goyen's way of working thus also fits into an ancient art-literary tradition. Accounts of working behaviour such as that of Porcellis – 'how he first formed the whole conception of his work in his imagination, creating the painting in his mind before he put his brush into the paint' – appear early in the literature of art as well. In 1604, Karel van Mander, for instance, refers to artists who only set to work when what they intend to paint on their panels 'has already been painted in their Mind's eye'.[8] According to Panofsky, this conception of the process of creating a work of art can be traced back to Cicero's theories of rhetoric.[9]

If indeed we are looking here at a chain of topoi rather than a report of an event that actually took place, Hoogstraten must nevertheless have had some purpose in mind in using these topoi in his account. The point that Hoogstraten must have actually intended is made clear in Emmens' book Rembrandt and the Rules of Art. Emmens discovered this point by analyzing the context in which the anecdote was told.[10] Hoogstraten in fact tells his story in the context of his treatment of the theme of 'skill'. Shortly before introducing the story of the painters' contest, he indicates in a few sentences three basic ways of achieving a good painting:

> *Whether the mind acquires the ability to form immediately the desired image; or whether* a423 *the eye picks out single forms in rough sketches of chance objects, as we do when we sit at the hearth gazing into the fire; or whether the hand makes something by habit, more or less as when we write; for a good scribe makes fine letters without thinking about it, as though the mind and the eye were placed in his hand.*[11]

The first way (to form the 'desired image' before the painting is begun), was linked by Emmens to the art-theoretical concept of Idea (translated in Rembrandt's days as 'first idea, imagination or thought').[12] In the contest, this approach was employed by Porcellis, who won the competition as a result. Emmens saw a connection between the second manner (letting the eye seek forms by chance) and the concept of Fortuna (luck or chance). This was the method used by Van Goyen; while the third manner (letting the hand find its own way out of habit) was related to the concept of Usus (use, practice), the approach to painting under-laying Knibbergen's way of working. On rereading the anecdote, this theoretical framework immediately strikes the eye, and one wonders with Emmens whether the incident ever really took place or whether it is a matter of theories merely cast in a narrative form.

So far, Hoogstraten's account can only be tested against reality in the case of Jan van Goyen, whose method of working has been investigated by Melanie Gifford.[13] In her study, Gifford showed that Van Goyen began with a systematic working method rooted in the mannerist theory of art. But just at the end of the twenties, he changed his approach drastically. The results of Gifford's research on his paintings from the period when the contest was held correspond with Hoogstraten's picture of Van Goyen at work in two important respects. Firstly, the summarizing characteristic which she attributes to a Van Goyen from that period recalls the image evoked by Hoogstraten's description. In this period, according to Gifford, 'Van Goyen had already profited from the possibility of allowing all preliminary stages to enter into the definitive picture'.[14] In other words, the details of the scene are locally introduced onto the transparent underpainting, through which the ground is visible. One can visualize this combination of preliminary stages as *'a variegated agate or marbled paper'*, to quote Hoogstraten again. The sequence in which Van Goyen picked out the details, from the back forwards according to Gifford, also corresponds with Hoogstraten's account, where first the distant background is painted while the enumeration of elements in the painting ends with ships and barges, laden with their cargoes or travellers, in the water whose lapping waves are described and which must therefore be situated in the a428 foreground (see also p. 32ff for the procession from background to foreground).

In the most important respect, however, the results of Gifford's investigation deviate from Hoogstraten's text. Van Goyen in fact did make preliminary sketches on his panel, though usually extremely rough ones, before applying his monochrome underpainting.[15] This preliminary drawing and the underpainting laid over it, here light, there darker, were so rough that the painter had to add the 'various amusing drolleries' to it, perhaps inspired by the chance forms of his rough underpainting, but chance certainly did not govern the process as completely as Hoogstraten suggested. As far as Van Goyen is concerned, we now know for certain that Hoogstraten's text was, up to a certain point, theory dressed as narrative, a topos with regard to fortuna.

A similar development in art historical research has also transformed our reading of seventeenth-century studio scenes. As with Hoogstraten's text, interpretations of the studio scene and the self-portrait have over the last decades evolved from snapshots of daily life in the seventeenth century to ico- nological delicacies, in particular as potential statements of art-theoretical positions.[16] This also happened with a number of Rembrandt's self-portraits. The so-called Laughing Self-Portrait (fig. 118) in Cologne has been convincingly decoded as a painted statement against the rising classicism.[17] Broos has proposed an ingenious and thoroughly documented interpretation of the Kenwood self-portrait with the circles (see fig. 254), in which Rembrandt's ideas about artistic perfection, symbolized by the circle, were related to the deliberately unfinished character of this work.[18] Hans Joachim Raupp and

Marieke de Winkel, the latter mainly on the basis of historical research on costumes, read art-theoretical allusions on an even greater scale into Rembrandt's self- portraits.[19]

fig. 118Rembrandt, Self-Portrait as Zeuxis. Canvas 82.5 x 65 cm. Cologne, Wallraf-Richartz-Museum. Infrared photograph (see fig. 306 for a colour reproduction)

[h2] Rembrandt's Boston Studio Scene and its Art-Theoretical Statement

In this connection, one might also ask oneself whether Rembrandt's sole painted studio scene, from around 1629 and now in the Boston Museum of Fine Arts (see fig. 102) should perhaps be considered as an art- theoretical statement as well. Whereas in other seventeenth-century studio scenes hidden meanings have been identified on the basis of meaningful objects depicted, Rembrandt's studio scene is remarkably bare and there are no objects here which provide a key to identification. All visible objects relate to the artist's traditional methods of practising his craft: the easel and panel, the palettes hanging on the wall above the grinding stone, the table with two large bottles probably containing ingredients for the binding medium; palette, brushes and maulstick in the young painter's hands. No musical instrument symbolizing harmony,[20] no visitors being initiated into the knowledge of the art of painting, [21] no books, sketch-books, plaster heads or draperies referring to the painter's programme of in- struction;[22] no still life including the painter as a component figure referring to vanitas;[23] no model in the role of fama.[24] This is just a bare workplace with a painter who is not working, but looking – or thinking. But thinking may be the very key to the meaning of this painting.

a441 We have to realize that what is depicted here is not so normal as it might at first seem: as already discussed in Chapter II, seventeenth-century painters sat at their work before the easel. In his report of the painters' contest Hoogstraten says as though it is self-evident: 'Beside this [Knibbergen] sat van Goyen.' In practically all seventeenth-century studio scenes the painter sits at his easel – this was possible even when working on large formats since, as is explained in some detail in Chapters II and VI, paintings in those days were worked up piecemeal, passage by passage. When we look at the lower crossbar of the painter's easel in the studio scene under discussion here, we see two broad depressions worn by scuffing feet. For the seventeenth-century painter, including Rembrandt, many hours must have been spent sitting at the easel. In his famous note written on the occasion of his visit to Rembrandt and his Leiden colleague Jan Lievens, Constantijn Huygens speaks of his concern over the constitution of the two young painters *'which, as a consequence of their sedentary life, is no longer as strong and robust as it used to be'*.[25]

Because of the unusual motif of the painter standing at a distance from his painting and in the light of the above discussion of the art-theoretical frame in which Hoog- straten's painting contest was situated, the question can now be asked whether the Boston studio scene may not represent one of the three methods of creating a painting summarized by Hoogstraten and illustrated by his anecdote. Might not this studio scene, with its non-painting painter, contain a reference to the way in which the painter is *'first making the painting in his mind before putting his brush into the paint'*? This was, after all, the way Porcellis won the painting contest.

The idea that the conception – which Van Mander called the 'idea, imagination or thought' – must first ripen before a work can begin to be executed appears several times in Van Mander's text. This is significant because in 1604 he was the first to publish such ideas on

the theory of art in the Dutch language. One of the biographies in his 'schilderboek', that of Jan Gossaert van Mabuse (died c. 1533), begins like this:

> *The art of painting which is first born in the spirit or the mind through the inward imagination, before it can be nurtured by the hand and brought to perfection...*[26]

In his account of the art of drawing Van Mander asserts that the perfection of this art can only derive from a full understanding which has to be developed through practice, enhanced by active vigilance and by fortifying the innate talent. Van Mander then continues,

> *That everything, according to his proper judgement, leads the Artist in his imagination to make a rough design of everything he may be pleased to sketch with the hand.*[27]

This idea about the conception of a work of art must have been a hot issue in the studios (see also note 8). The question is therefore legitimate whether Rembrandt – as argued above – could also have been making an art-theoretical statement of just this kind through his Boston studio scene (fig. 102).

If this were the case, the idea would become significantly more suggestive that Rembrandt, who was after all Hoogstraten's teacher, might also have been the source of the anecdote. If the painting contest did a445 actually take place, it must have been held in the very period in which Rembrandt was painting, or was about to paint, his studio scene, around 1629/30. In view of the close correspondences between the biographical data of the three painters and of the stylistic interactions among their works (see my comments interspersing Hoogstraten's account above), there are sufficient reasons to take the suggestion that this contest did actually happen seriously. In that case, we would be dealing here with a real event that in due course has been transformed and loaded with art-theoretical significance, possibly by Rembrandt himself.

If Rembrandt in the Boston studio scene was illustrating the art-theoretical proposition that the artist ought to create his picture in his imagination first before beginning to paint, that could also mean that he belonged to those painters who, as Van Mander put it,

> *are used to drawing fluently by hand on their panels what they have already seen painted in their mind's eye.*[28]

That is the impression one receives when closely studying the genesis of his works (see Chapters II and VIII). Like Porcellis, in conceiving his paintings, Rembrandt would be primarily relying on Idea.

None of this, however, is to say that Rembrandt had no use for Fortuna in the creation of a painting. Aristotle, whose writings had enormous influence on ideas about art in the Northern Netherlands in the first half of the seventeenth-century, wrote: 'Art loves chance and chance loves art.' [29] For Rembrandt, chance was certainly also an important factor. One only has to think of the most appropriate remark by Sir Joshua Reynolds on Rembrandt's manner of painting (also quoted on p. 190):

> *Works produced in an accidental manner will have the same free, unrestrained air as works of nature, whose particular combinations seem to depend upon accident.*[30]

However, although Rembrandt undoubtedly gave free reign to Fortuna in the execution of his paintings, especially in his later ones, the interpretation offered above of the Boston painting may be seen as an indication that where the conception of his paintings was concerned, Idea was his first Muse.

a450

[h1] V The Canvas Support

DOI: 10.4324/9781003702764-5

fig. 119Cornelis Deckers, *Weaver's Workshop*, 1659. Panel, 45 x 57 cm. Amsterdam, Rijksmuseum. Detail

[H2] INTRODUCTION

a453After working almost exclusively on panel during his years in Leiden, Rembrandt increasingly made use of canvases in Amsterdam. Canvas as a support for paintings in oil was introduced in Italy by the end of the fifteenth century. Its use as a support for paintings with other binding mediums, however, dates much further back; stretched over wooden panels, it was already used in Ancient Egypt during the New Empire and later.[1] Pliny mentions its use in the Roman period.[2] Banners and other textile objects for temporary use could be decorated with paint. From the fifteenth century on, paintings in a glue medium on relatively fine fabric have survived by or in the style of such painters as Rogier van der Weyden, Hugo van der Goes, Mantegna, Dürer, Brueghel, Hans Bol, Jacob Cornelisz. van Oostzanen and many others.[3] Painting in oil on canvas most probably developed in Venice. Titian was the first to use mainly canvas supports. Miedema and Meijer give statistics showing that canvas superseded wood as the usual support in Venice.[4]

Vasari mentions as an advantage of canvas that it is *'of little weight and, when rolled up, easy to transport'*.[5] In the same vein, Samuel van Hoogstraten in his discussion of the advantages of canvas, pointed out that canvas is *'suited most for large paintings and, when well primed, easiest to transport'*.[6]

In the Netherlands the use of panels was not superseded by that of canvas to the same extent as in Italy.[7] Rembrandt used panels throughout his career, even for relatively large paintings. During his later years canvas was, however, more frequently used.

a461The production of large-size portraits and history pieces, starting in the early Amsterdam years, explains the frequency with which Rembrandt used canvases from 1631 onwards.

Two reasons prompted me to undertake an investigation of these fabric supports. In the first place, earlier investigations had raised the hope that the thread density (as I shall call the number of threads per unit of length in the two directions) might provide a rough but valuable criterion when dating paintings, which could be of some value when identifying later imitations.[8]

Secondly, there was the question of why one or more sides of the canvas frequently show no signs of cusping or scalloping, i.e. deformations in the fabric due to stretching. Might one infer from an absence of cusping, that a painting like this had later been reduced by other hands on the side or sides in question?

Research in the area of fabric supports has been less extensive than the study of panels.[9] Of course, there have long been general notions as to the differences in the kinds of canvas used by various schools or periods.[10] In sixteenth-century Venice, for instance, twill canvas was frequently used, while in the eighteenth century Italian canvas often had an open, almost gauze-like weave. Methods of stretching have occasionally been the subject of study,[11] but those used in seventeenth-century Holland have scarcely been looked at,[12] and there have been only a few limited attempts at a systematic examination of the types of canvas occurring within the oeuvre of a single artist.[13] In questions connected with the enlargement of fabric supports by later hands, restorers usually do pay attention to the nature of the seams and the difference in canvas structure, but they have rarely reported on these in publications.[14] In the case of seventeenth-century Dutch canvases in general, Meier-Siem has done statistical study on a somewhat broader scale, based on the paintings in one

museum;[15] he concentrated on measurements and the comparison of thread densities. Following his example, similar measurements were made on the Rembrandts on canvas in the Mauritshuis.[16]

In a few other instances the study of individual paintings by Rembrandt has included attention to the canvas. On the basis of the theory that the *Syndics* (see fig. 239) was painted on a piece which might be cut from the canvas of the at some time heavily trimmed *Claudius Civilis* a study was made of the fabric of the canvases in question: the canvases turned out to be from two different bolts.[17] In another case, that of the Berlin *Samson Threatening his Father-in-law* (see fig. 135), the study of cusping played a part in the discussion of the original format of this painting.[18] The matter of the width of the fabric as it came from the loom – or 'strip width' – has likewise been looked at a few times in connection with Rembrandt's paintings.[19] Although the significance of the painter's canvas as a source of information has not been ignored then, one can say in general that the opportunities for incorporating this kind of information in art-historical research have scarcely been explored.

The main reason why the fabric support has so far attracted relatively little attention is that it has hardly been accessible to study. By far the majority of old paintings has the backs of the canvas covered by a layer of lining canvas,[20] while the edges have usually been trimmed off during previous a475restorations.[21] It is for that reason exceptional that observations can be made on the canvas itself; one is largely reliant on radiographs, and these usually cover only part of the painting. There are hardly any really large coherent collections of X-ray photographs made with a scholarly purpose in mind.[22] Existing collections of X-rays relate as a rule to the collections of a particular museum, where the radiographs have been kept on file after using them in answering incidental questions, usually to do with the paint layer. The Rembrandt Research Project has at its disposal X-rays of c. 250 paintings on canvas that Bredius attributed to Rembrandt. In c. 130 instances these take in the whole surface of the painting, while the remainder cover only part of it. The scope of this collection warranted an attempt to answer the questions that have been touched on above; in doing so, other aspects will be looked at that can provide a picture of the practices followed in Rembrandt's workshop where canvases are concerned. The main period considered here is from 1631 to 1642.[23]

[H2] RADIOGRAPHS AS A MEANS OF STUDYING THE CANVAS

As a rule, the weave of the canvas is readily observable in radiographs, as are any cusping and seams present. However, it is important to keep in mind that canvas as an organic material scarcely absorbs X-rays – it is the imprint of the canvas in the radioabsorbent layer of ground that provides an image of the canvas structure. As a consequence, the lining canvas itself is usually not visible in the X-ray.[24]

This can be demonstrated most clearly in Rembrandt's *Claudius Civilis* (Br. 482) which, like other works done for the Amsterdam town hall, was originally on a twill canvas. This painting underwent a complete transfer to a new canvas after the old canvas was removed.[25] It now has a canvas with a linen weave as its support. On the radiograph, however, one can still make out the weave of the twill canvas that was removed, and there is no trace of the new support.[26] One can, in fact, take it as a rule that the canvas structure seen in an X-ray is that of the original canvas. Various circumstances, however, can result in exceptions to this rule, so that misleading conclusions may confuse the outcome of studies of the canvas. In some cases the backs of paintings have in the past been covered, as a conservation

measure, with paint that proves to be radioabsorbent. When this was done on the back of the original canvas, as in the case of the London *Belshazzar's Feast* (see fig. 162), the results of thread counting are unaffected, though there is a drastic change in the appearance of the fabric (fig. 120).[27] But where this layer of paint was applied after the painting had been lined, as with the Kassel Rembrandts,[28] the structure of the lining canvas may 'swamp' that of the original canvas in the radiographic image. The results of thread counting will then give misleading information. Only if a radiograph of the whole painting is available can such a result be avoided in cases like this, for when this layer of paint was applied the areas underneath the stretcher remained bare (figs. 121, 141), and a thread count can be carried out in those areas. Another danger lies in the possibility that when the original canvas was removed, the weave imprint of this original canvas was sanded away during the transfer operation. This seems to be the case with the London *Flora* (fig. 122), where only in places along the edges this has evidently not happened; there, the imprint of the original canvas in the radioabsorbent ground can still be seen, while elsewhere there is a fine and very regular structure which is evidently due to a radioabsorbent adhesive used for sticking the new canvas to the back of the paint layer. From descriptions of the usual methods for transferring canvases it is, however, clear that abrading the layer of ground was not the rule.[29] The occurrence of exceptions to the rule just mentioned that only the original weave is seen in the radiograph makes one cautious in using thread counts of old paintings done from X-rays, but in our experience these are indeed exceptional cases, and in general the radiograph is a reliable source for studying the fabric. For greater legibility, details from X-rays which show the canvas weave will be reproduced here as positive prints (figs. 123, 124).[30]

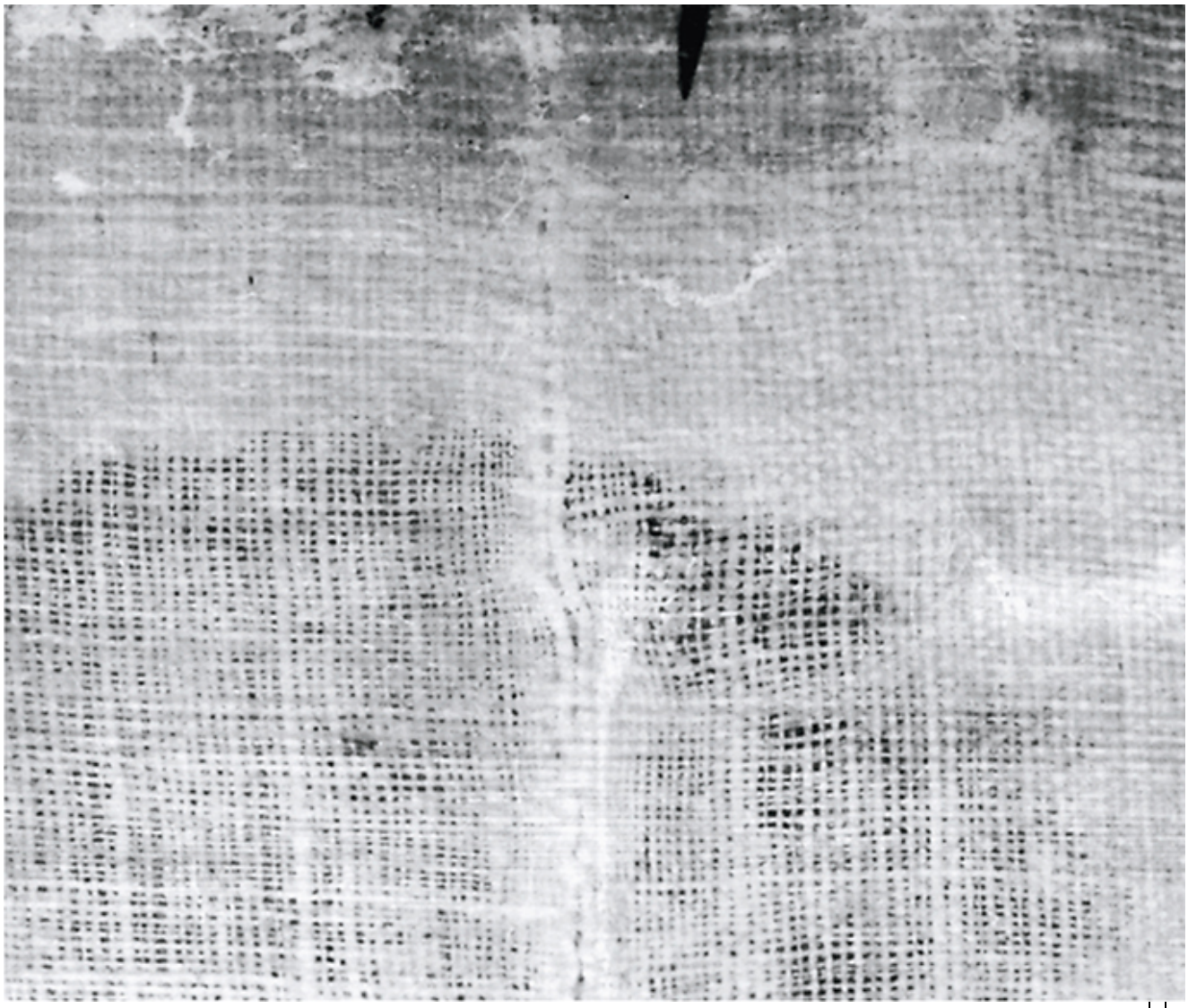


fig. 120Rembrandt, *Belshazzar's Feast*. London, National Gallery (see fig. 162). X-ray indicating the back of the original canvas as partly filled with radioabsorbent paint layer (see lower part of illustration). Warp vertical (positive print)

a488

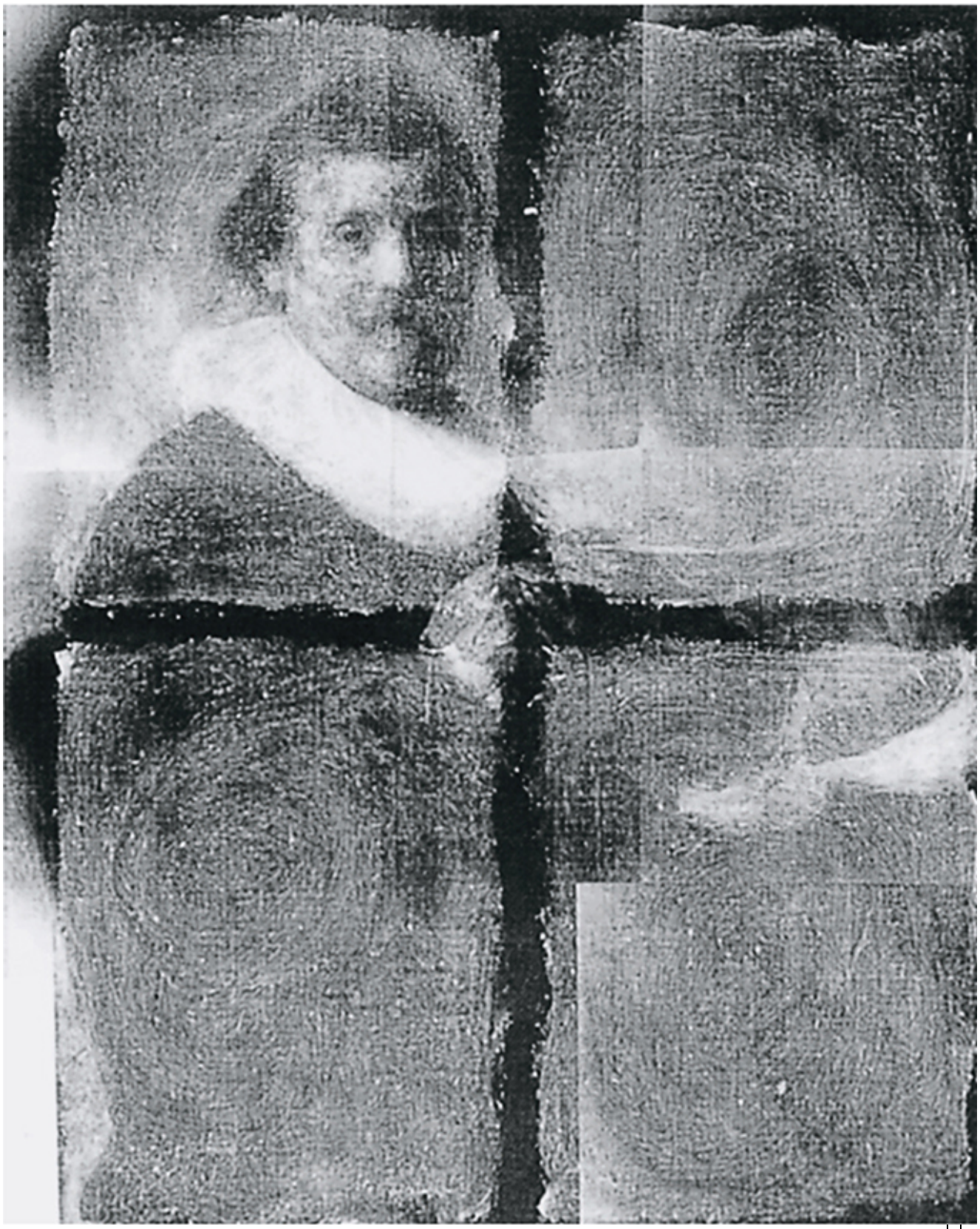


fig. 121Rembrandt*, Portrait of a Man Trimming his Quill* (see fig. 141). X-ray

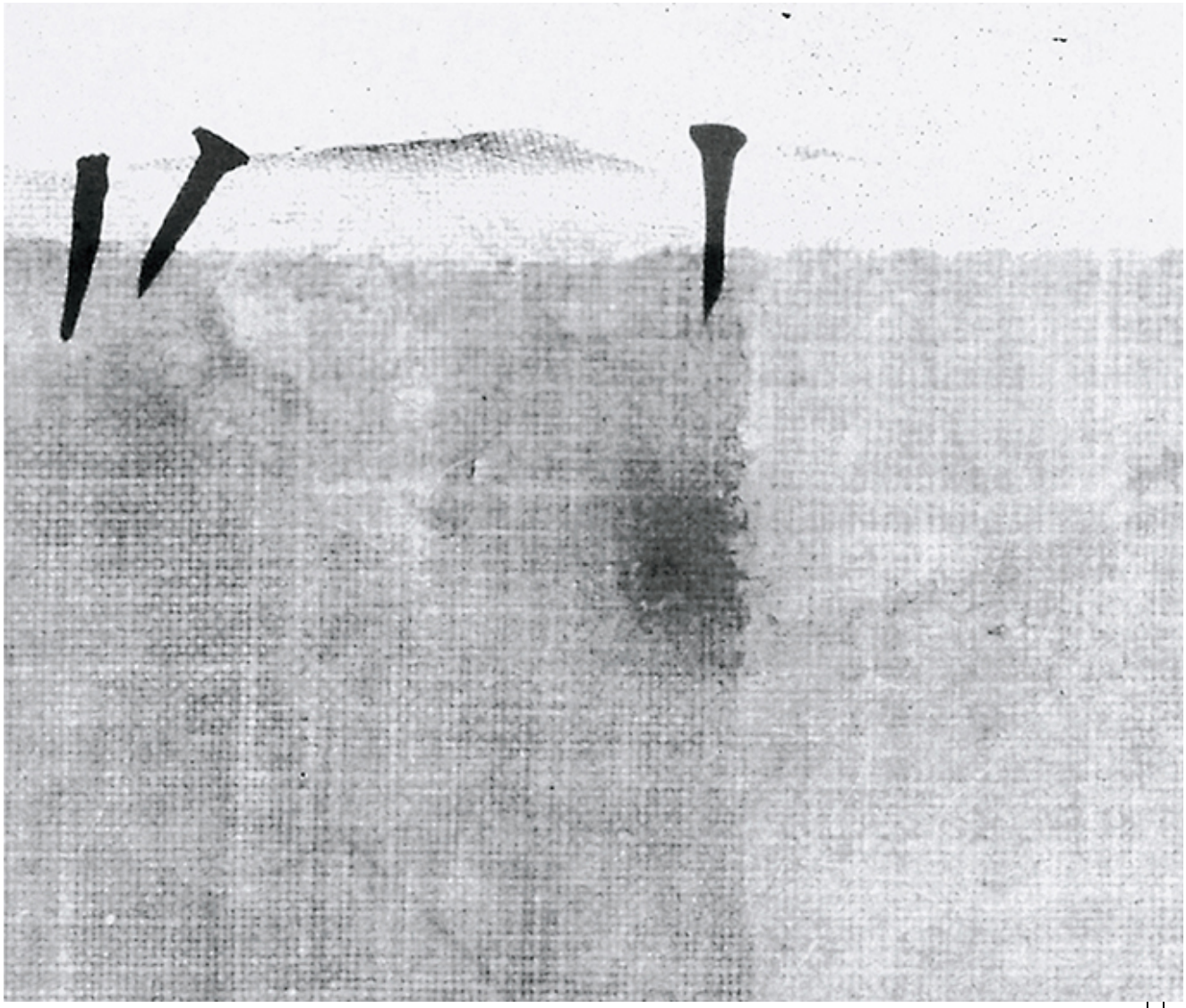
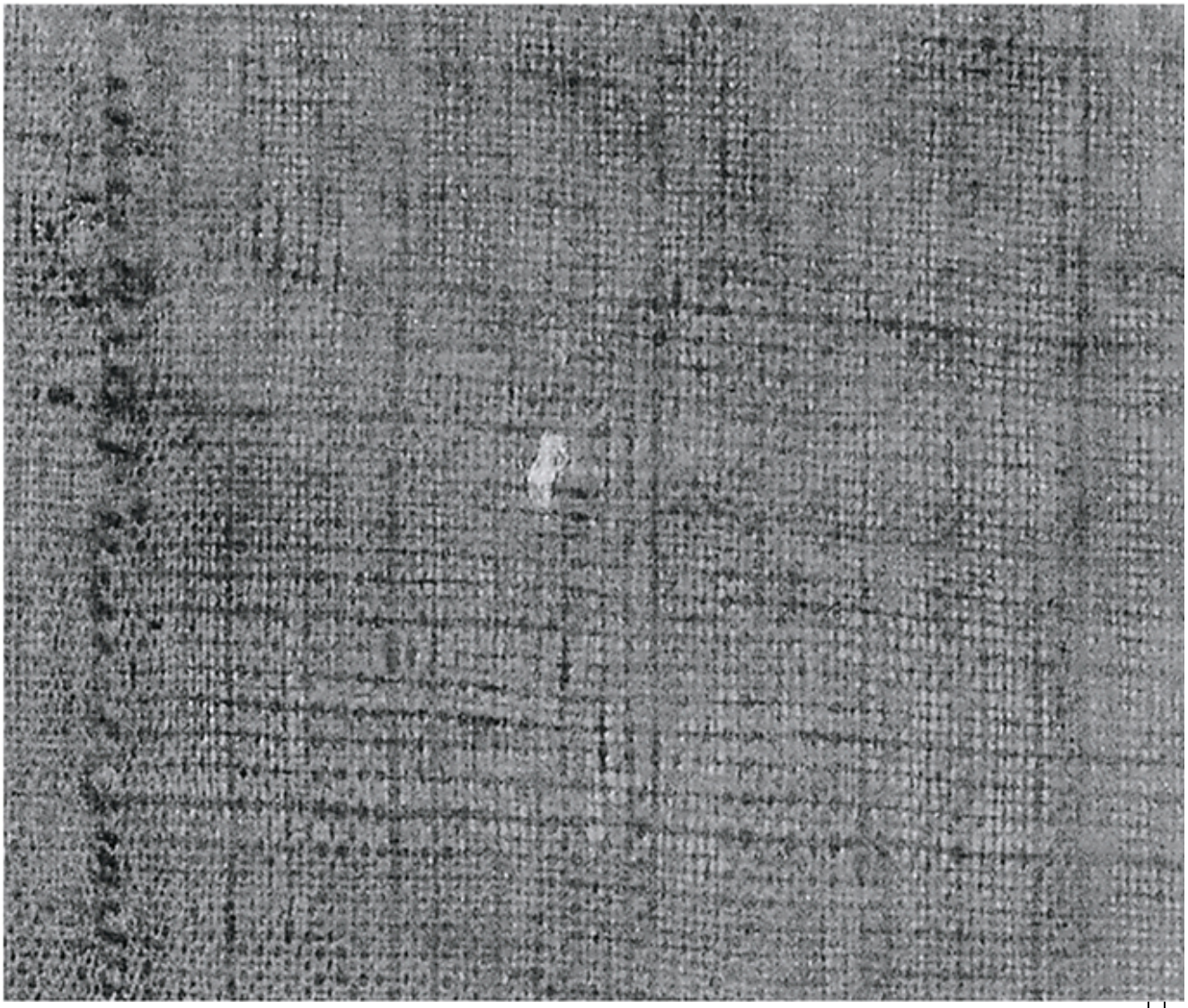


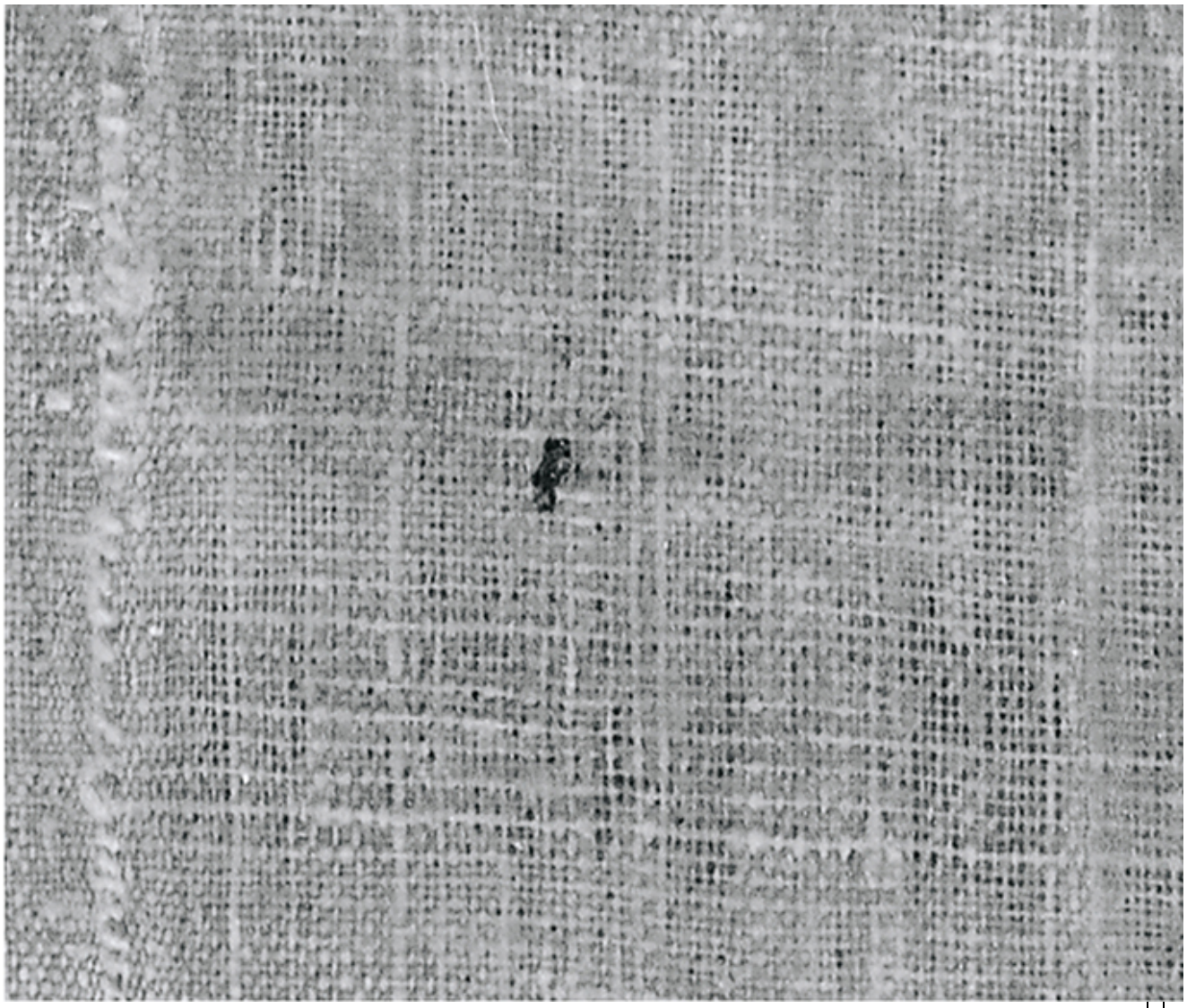
fig. 122Rembrandt, *Flora*. London, National Gallery (Br. 103). Detail of X-ray, showing the imprint of the original canvas and the structure of the finer transfer canvas (positive print)

Using only radiographs when studying canvases naturally entails a number of limitations. It is not possible to trace all the properties of the yarns in the weave; it is impossible to say, for instance, whether flax, hemp or some other fibre material was em- ployed,[31] nor can one tell anything about aspects such as the direction or angle of twist in the spun thread.



figs. 123Rembrandt, *Still Life with Peacocks*. Amsterdam, Rijksmuseum (see fig. 125). Detail of X-ray, demonstrating the better legibility of the weave in the positive print to the right

a493



[H2] HISTORIC SOURCES ON THE NATURE AND ORIGIN OF CANVAS USED BY PAINTERS

Artist's canvas, as such, did not exist in the seventeenth century, in the sense that weavers or those commissioning them did not produce fabric especially for painters. The fabric used by artists was produced with other functions in mind. Dutch sources mention ticking, which was woven as a covering for mattresses and quilts, sailcloth, produced for shipyards, and linen cloth intended for clothing, bedding and the like.[32] An English source speaks of *'sackcloth'* or *'sackencloth'*, apparently intended for packing goods.[33] Such canvas was not manufactured in urban centres with strict quality control, as was the case with the finer kinds of cloth,[34] but came from rural areas like Twente, the Achterhoek in the eastern part of the Netherlands, the countryside of North Holland, and Brabant.[35] It was, however, also imported on a large scale from, for instance, north-west France, Silesia and Westphalia.[36] We know from eighteenth- a500century sources that in that period there were cloth factors, merchants who supplied the weavers with orders and with the material they needed;[37] probably this system already existed in the seventeenth century as well.

fig. 125Rembrandt, *Still Life with Peacocks*, c. 1639. Canvas, 144 x 134.8 cm. Amsterdam, Rijksmuseum

The cloth was woven in various widths (see also below). Again, we know from eighteenth-century sources a great deal more than we do about the seventeenth century, but the widths of canvas encountered in the course of this investigation tend to match the standard widths mentioned there, therefore we can suppose that these strip widths had already been common for a long time.[38] The articles to be manufactured from the canvas were obviously based on the existence of such standard widths. In a sail loft, for instance, the size of the

sails was expressed in the number of *'cloths'* needed, and since we know from various sources that the Dutch sailcloth weavers produced strips three feet wide we can assume that *'a cloth'* had a width of about 85 cm (or ' 5/4 *ell*').[39]

[H2] THREAD DENSITY

It is quite obvious that with such diverse origins and such differing functions, there were appreciable variations in the fabric supports. It is true that the great majority of the canvas used by Dutch painters exhibits a tightly woven linen weave, but this occurs in widely varying density and yarn quality (see table A, p. 98-99). Paintings on twill canvas represent only a small percentage.[40]

Whereas with twill there are a large number of criteria for distinguishing one fabric from another since there are innumerable variants in the pattern of intersection of the threads, the pattern in linen weave is simple and invariable.[41] The only way to compare canvases with a linen weave is to measure the number of threads/cm in the warp and weft (a 'thread count') and, so far as the radiograph allows, to compare the peculiarities of the yarn used. To ascertain the thread density, counts have to be taken at various places on the painting in both warp and weft, after which average values can be worked out.[42] It is important to record the spread of the counts, so as to form an impression of the degree of irregularity of the thread density (see table B, p. 102-107).

The thread density within one and the same canvas – even very large canvases such as that of the *Night Watch* (see fig. 245) which has three strips of cloth from the same bolt totalling 13 m in length – is fairly constant; at all events, it is constant enough to say that if the average number of warp threads per centimetre differs by more than one thread, one can practically discount the possibility of the canvases in question coming from the same bolt of cloth. The number of weft threads, with their often more varying thicknesses, can differ a great deal more within a single bolt, especially since the force with which the threads are beaten up during the weaving process can vary, so that they may be packed together more or less closely. When comparing thread counts, therefore, the count of the warp threads is the more significant figure.

It has been noted that in the course of the seventeenth century painters tended to use canvas of ever increasing coarseness. Prescott made a passing reference to this tendency in connection with Italian, Flemish and Spanish paintings on canvas.[43] He explained the phenomenon as due to a510the growing confidence in the adhesion of newly developed priming materials to the canvas. His explanation implies that a coarser canvas would have a more open structure, so that the ground could even 'lock into' the canvas. In the case of the canvas used by Rembrandt, this is not so; with both the coarse and the fine, and the early and late canvases, the ground only occasionally penetrates between the threads. On the radiograph these places show up as isolated or clustered spots of white (figs. 126, 127). As a rule these canvases were obviously treated with glue size in order to seal the fabric (see also p. 129).

Meier-Siem, examining the canvases of mainly North Netherlandish seventeenthcentury paintings, believed that the explanation for the use of a coarser canvas weave could be sought in an assumed predilection of the painters for the visibility of the canvas structure as a deliberate effect.[44] This explanation is unsatisfactory, as it can be deduced from seventeenth-century recipes for preparing the canvas that the aim was to render the surface of a prepared canvas as smooth as possible.[45] With paintings that are still in a very good state of preservation the weave of the canvas is indeed scarcely apparent. The key to a

much more plausible explanation for the phenomenon has been found by K. Levy in sources relating to the sailcloth weavers in the village of Wormerveer. Apparently they tended, for reasons of economy, to set up fewer and fewer warp threads in their loom, for an ostensibly unaltered quality of canvas. The shipyards complained about this form of cheating, whereupon the quality of canvas (which had already become coarser) was officially imposed on the weavers as a fixed standard; however, the same trend to-wards using fewer warp threads continued.[46]

From the chance recording of the case of the sailcloth weavers of Wormerveer one may cautiously conclude that a tendency to use fewer and fewer threads per unit in order to cut costs, was a general one. Table A (p. 98-99) shows, however, that wide variations in thread density remained through-out the seventeenth century, and though the number of coarse canvases did increase over the century, there can be no question of even approximately dating a canvas on the ground of its thread count.

One is struck by the fact that there is no correlation between the size of the canvas and the thread density. Very large paintings such as that of the *Anatomy Lesson of Dr Tulp* (see fig. 250), the *Man in Oriental Dress* (Br. 169) and the Portrait of *Cornelis Anslo and His Wife* (Br. 409), are painted on canvases of relatively fine weave, whereas a painting of modest size, such as the *Entombment* (Br. 560), may be on an extremely coarse canvas (see table B, p. 102-107).

[H2] PROBLEMS IN DETERMINING THE WARP DIRECTION

A precondition for a proper use of the thread counts obtained – as for that of other data such as the strip width – is that one can tell the warp from the weft. As the number of threads/cm usually differs between the two directions, comparisons between thread counts on different canvases can be carried out only if the correct values – i.e. the number of warp threads and weft threads in each case – are compared. The original selvedges usually have been lost (see note 21). (An exception can be seen in fig. 156.)

figs. 126Rembrandt, *SelfPortrait*, 1669. The Hague, Maurits- huis. Details of the back of the original canvas, illustrating the ground locally penetrating between the threads (visible as dark gray protrusions just above the centre) and the corresponding detail of the X-ray reproduced as a negative, where these protrusions show as white spots

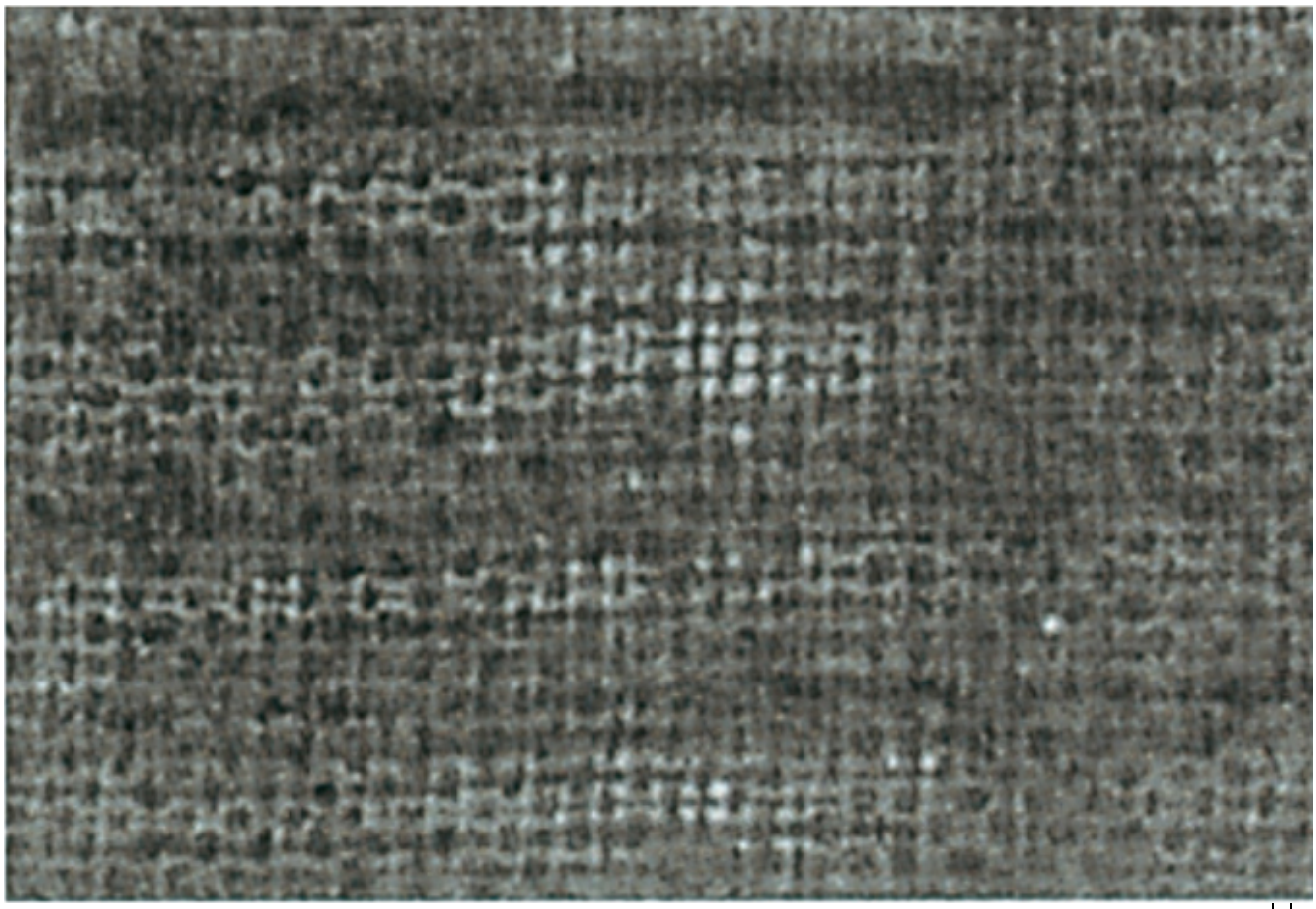
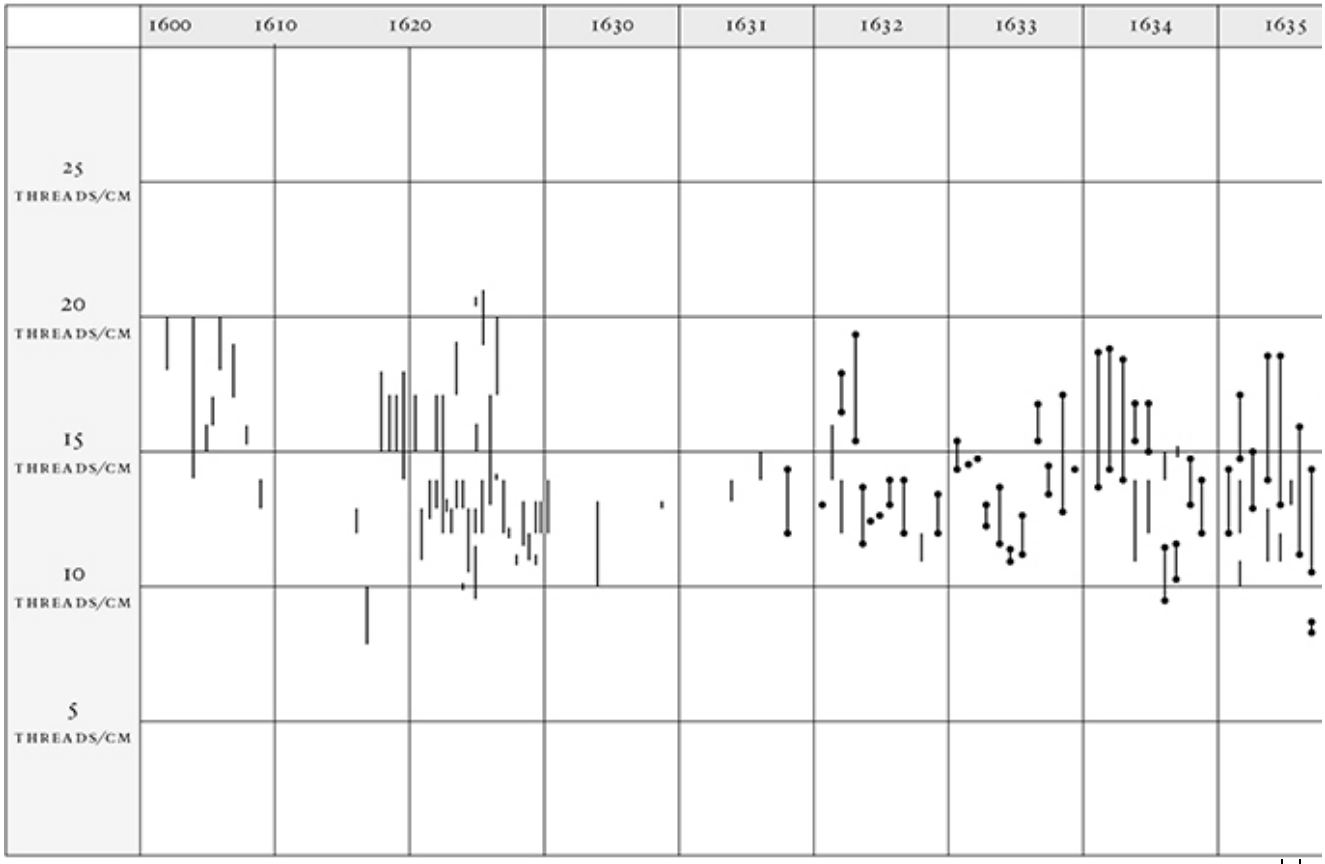
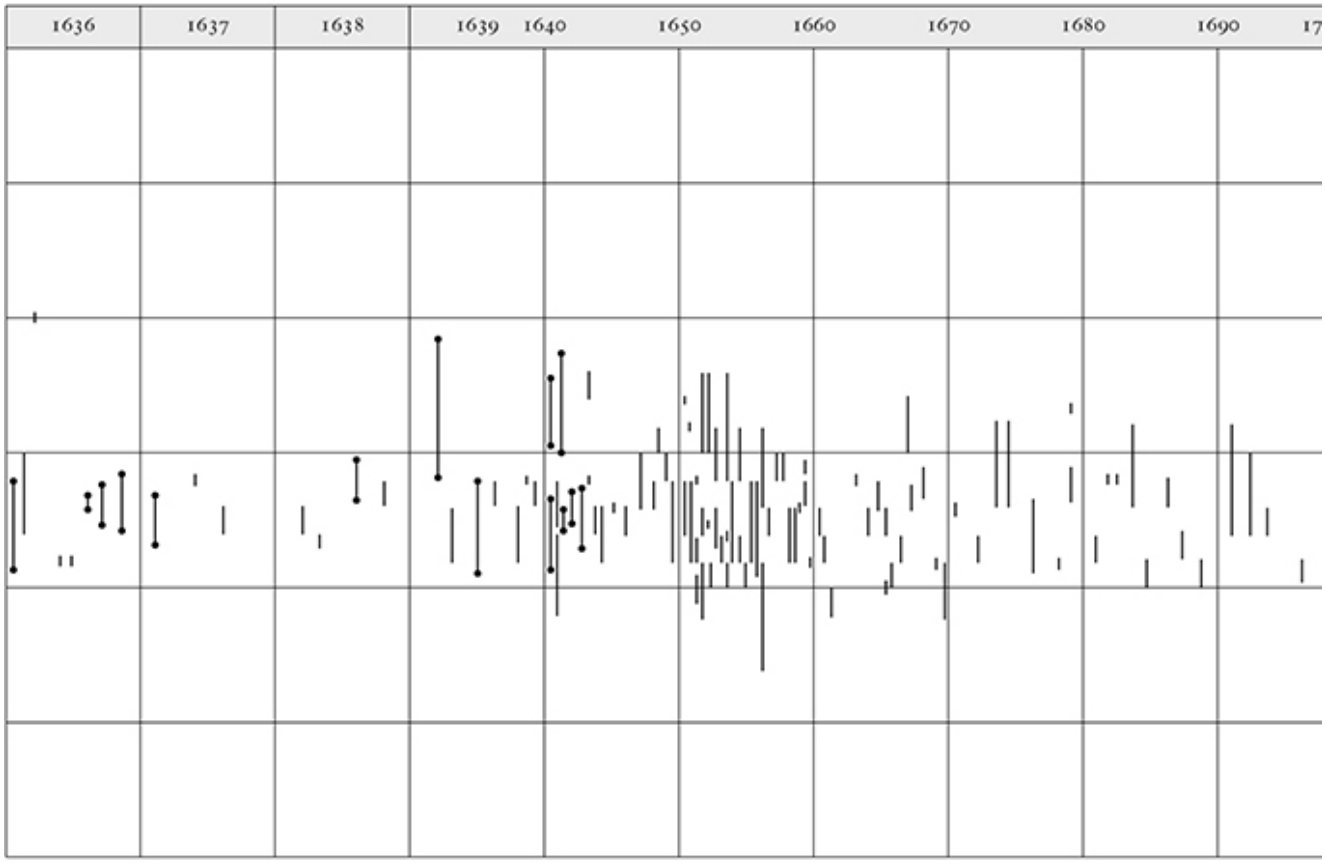


Table A a517A survey of threadcounts of canvases used for Dutch pictures over the period 1600-1700The average numbers of threads per cm in each direction are represented by the extremities of a line; no distinction is made between warp andc Idem in cases where the numbers of warp and weft threads are equal. weft. In the case of paintings by Rembrandt or his school, dots mark the extremities. When the number of threads is the same in each direction, it is indicated by a short line or a single dot respectively.



Thread density of canvases used by Rembrandt and his workshop, the dots indicating the average numbers of warp and weft threads respectively.Idem in cases where the numbers of warp and weft threads are equal.

With canvases of very large dimensions this presents no problem, as one can take it that the warp runs the length of the strip of canvas. But with somewhat smaller paintings it cannot be taken for granted that the lengthwise dimension of the painting is at the same time the direction of the warp.[47] When canvas supports have an original seam, one may assume (with some reservation) that the warp runs parallel to it (see table C, p. 124). Most canvases do not, however, have a seam, and both the lengthwise and the widthwise dimensions come within the largest strip width we have encountered, which is 210 cm (3 `*ell*') for the seventeenth century.[48] In that case, criteria for detecting the warp direction must be found in the nature of the cloth itself, as seen in the X-rays. These criteria can vary. Of the various ways of determining the warp direction that have been tried during this investigation,[49] only two can offer a fair measure of certainty. One is caused by the fact that in some kinds of canvas there is an obvious difference in quality between warp and weft threads. In these cases one may assume that the threads running in the warp direction are more evenly spun (because they have to withstand high stresses during the weaving) while those in the weft direction display frequent thickenings. Coarse fibres were used for spinning the latter,[50] and sometimes even the 'left-overs' from when the fibres were hackled.[51] Thus, there is a greater likelihood of short lengths of thicker thread occurring during the spinning, especially since the yarn for the weft is probably not twisted as tightly. [52] Where this discrepancy in yarn quality is noted, it may be assumed that the more regularly spun threads are the warp (see fig. 124).



a524Thread density of canvases used by seventeenth-century painters other than Rembrandt, the extremities indicating the average numbers of warp and weft threads respectively.Idem in cases where the numbers of warp and weft threads are equal.

A second criterion can be adopted in cases where there is no appreciable difference a525between the yarn quality in both directions. During measurements it has been found that, as mentioned earlier, the statistical spread in one direction is often much greater than in the other (see table B, p. 102-107). In canvases where for other reasons one can be certain of the warp direction, it can be seen that the number of warp threads/cm shows a great deal more constancy than does the number of weft threads/cm. An explanation may be found in the technique of weaving, namely, that the warp threads are held apart at the same distance by the reed, the 'comb' through which they run, each time the weft is beaten up. Variations in the force with which the weft threads are beaten up cause, as has already been explained, the greater variations in the density of the weft. Only with very evenly-woven canvases will neither of these criteria provide a clue as to the warp and weft directions.

[H2] THREAD DENSITY AND WEAVE CHARACTERISTICS OF CANVASES BY OR ATTRIBUTED TO REMBRANDT

Table A (p. 98-99) sets out chronologically the thread densities of the canvases that Bredius attributes to Rembrandt. The same table also shows the thread counts of a number of canvases painted by other Dutch artists.[53] In the first place, one notices that the thread densities of Rembrandt's canvases fit into the general picture, yet one is struck by the fact

that there is a considerable variety in his canvases over a given short period. The consistency of the thread counts would indeed be no greater if the paintings which are not thought to be authentic were disregarded. Remembering that the greater part of these were probably painted by artists working in Rembrandt's workshop, there would be no point in making such a distinction in this connection. We have too little information on the canvases of other Dutch painters to know whether such irregularity in the thread counts can be found in their canvases as well; this is, however, quite likely, as will become clear below.

The earlier discussion of the kinds of canvas mentioned in the sources as being used by painters, and the different places of origin of the canvas used, has already made it plain that a considerable variation was to be expected. It was not immediately obvious, however, that such would be the case within the oeuvre of a single artist. One would surely have thought that a painter would have kept one or more bolts of canvas in his studio, from which pieces could be cut as required. Yet one does not find any large number of canvases coming from the same bolt.[54] As a result of this investigation we know that the canvases of works by Rembrandt and his workshop companions over the period of three years from 1632 to 1634 came from at least twenty-five different bolts. However, one does come across quite small groups of canvases coming from the same bolt; a bolt being up to 60 metres long (see note 38). Within the period between 1631 and 1642 one finds several times a pair of canvases; once a group of three; and one of four: to the group of four may be added two small fragments incorporated in other paintings to which we shall return later (see table B, p. 104, and figs. 107, 132-136; see also note 58).

Such groups of canvases cannot be identified on the ground of matching a529thread counts alone – there have to be sufficient similarities in other properties of the fabric as well. One characteristic of canvas may be seen as an occasional thickening of the threads. These thickenings are admittedly not uniform in length, nor do they occur at regular intervals from each other; yet for all their irregularity they form a pattern which is typical of each fabric, and within one strip of cloth they usually display a certain degree of constancy provided that – as one has to assume – the threads used come from one and the same batch of yarn.[55] This pattern is hard to quantify – the dimensions of both the length and the width of the thickenings in the thread is irregular.[56] Yet after spending a long time comparing a great many canvas structures, one does develop a kind of expertise, an ability to recognize with a fair measure of certainty the similarities and differences in canvases which, because of a similar thread density, are candidates for closer comparison. Characteristic differences in the nature of the warp and weft threads play an important part in this. Properties that are harder to put into words – such as the impression of 'fluffiness' or 'smoothness' one gets from the threads – also play a role. A feeling develops for the 'style' of spinning and weaving, irrespective of whether these styles were dictated by material or technical circumstances or, indeed, by the individual spinners' and weavers' working habits.

What must appear to be a rather subjective method of grouping or distinguishing canvases will probably inspire little confidence in the reader – however, there are checks that can be made. In most cases where two canvases have been identified as coming from the same bolt, the paintings concerned are companion pieces.[57] It may be assumed of the canvases on which these were painted, that they were as a rule stretched and prepared in one and the same procedure. Only in the case of the *Pellicorne Portraits* (Br. 406 and 407) are the canvases found to be of different origin.

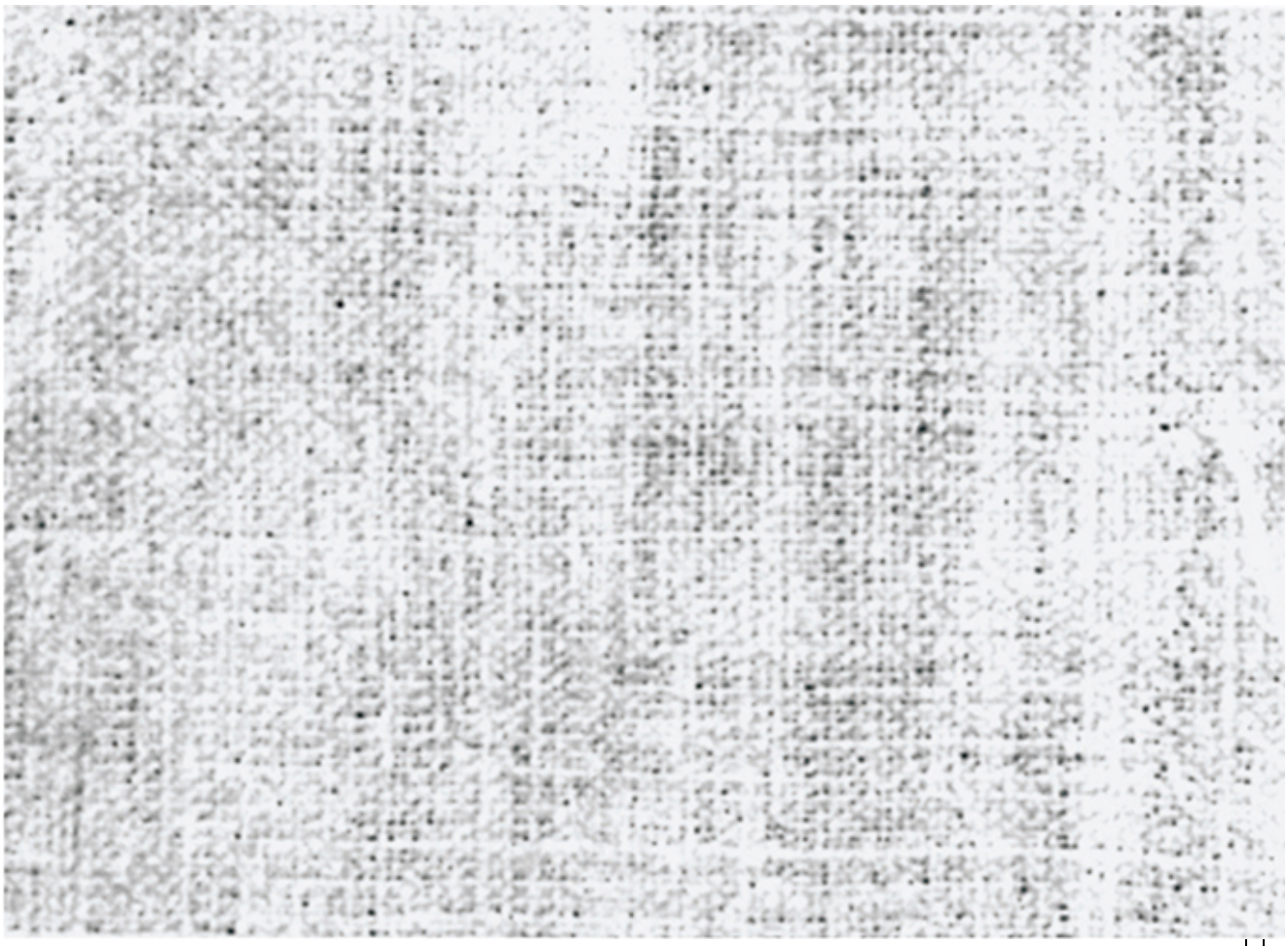


fig. 128Rembrandt, *Abraham's Sacrifice*. Munich, Alte Pinakothek, (see fig. 129). Detail of X-ray, showing a sudden increase in the number of the vertical warp threads near the centre (positive print)(see p. 107)

fig. 129Diagram of the canvases used for *Belshazzar's Feast*, London, National Gallery (see fig. 162), *Abrahams's Sacrifice*, Munich, Alte Pinakothek, and *Minerva*, Japan, private collection. The dotted lines indicate a weaving fault (see fig. 128) running through all five pieces of canvas constituting the supports of the three paintings (see p. 107)

Table B A survey of threadcounts of canvases used by Rembrandt or in his workshop over the period 1631-1642.*page 102-107* The order is roughly chronological, based on reliable dates inscribed on the paintings, presumed ones in [] and approximate ones preceded by *c*.Threadcounts are indicated with numbers of threads per cm, the aver-age number followed by the smallest and biggest number encountered in (). The upper figure indicates the number of vertical threads (reckoning from the subject painted on the canvas), the lower figure indicates that of horizontal ones.In the graph, closed dots represent the average numer of warp threads, open ones the average number of weft threads, vertical strokes the average of undetermined threads, the lines extending on either side of these represent the spread of numbers encountered. In cases where several procedure. Only in the case of the *Pellicorne* may be taken to come from one bolt, they are placed together, sometimes infringing on the chronological order, and their numbers are preceded by a square brace or, in the case of companionpieces, by a brace.

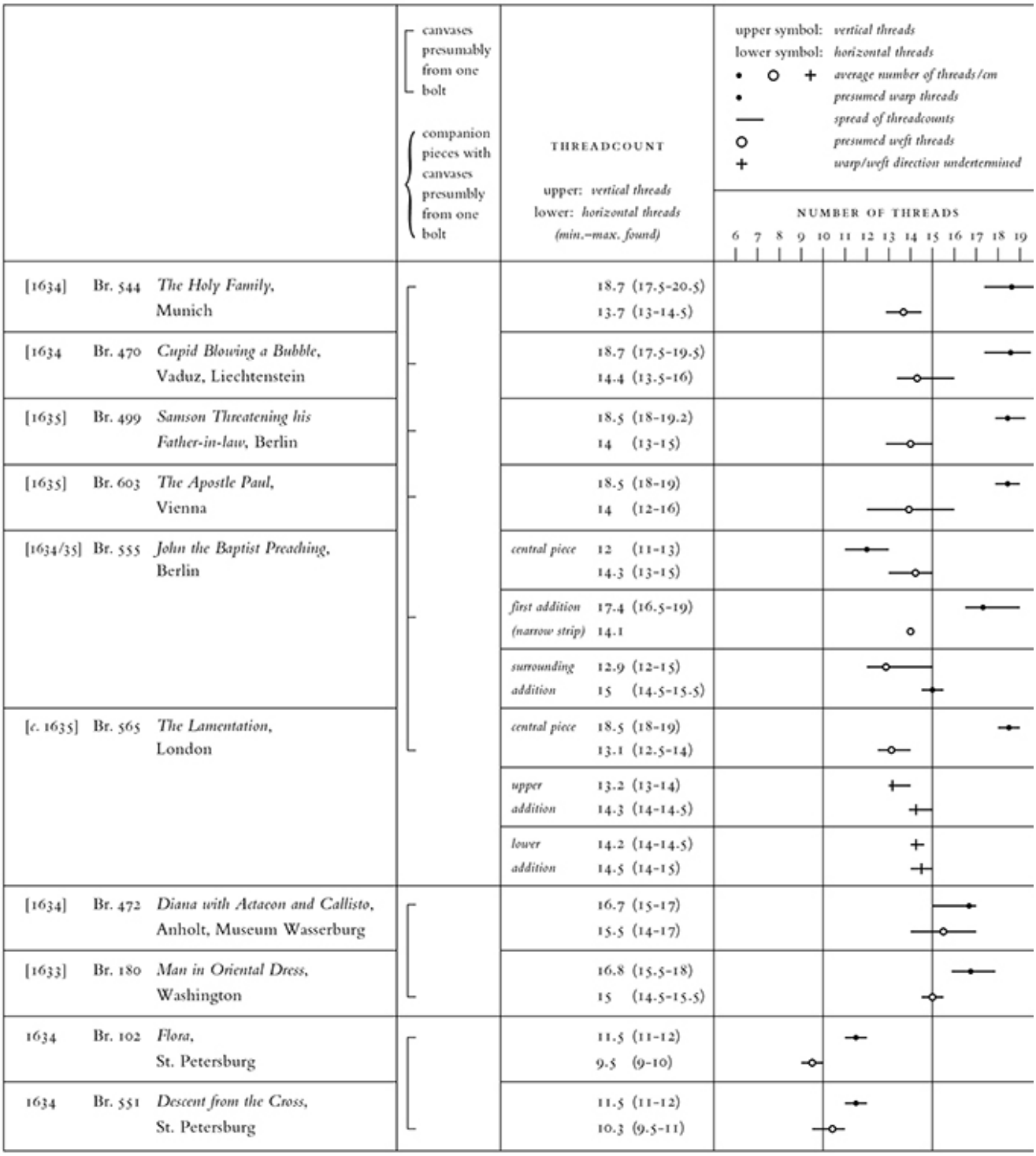
			canvases presumably from one bolt / companion pieces with canvases presumably from one bolt	THREADCOUNT upper: *vertical threads* lower: *horizontal threads* *(min.–max., found)*	upper symbol: *vertical threads* lower symbol: *horizontal threads* • ○ + *average number of threads/cm* • *presumed warp threads* — *spread of threadcounts* ○ *presumed weft threads* + *warp/weft direction undetermined* NUMBER OF THREADS 6 7 8 9 10 11 12 13 14 15 16 17 18 19
1631	Br. 146	*Portrait of a Man at a Writing-Desk*, Leningrad		12 (10–14) 14 (13–15)	
1632	Br. 609	*The Apostle Peter*, Stockholm		13.1 (12–13.2) 13 (12–14.5)	
1632	Br. 169	*Man in Oriental Dress*, New York		17.7 (17–18.5) 16.5 (15–17.5)	
1632	Br. 403	*Anatomy Lesson*, The Hague		15.3 (13.5–17.5) 19.3 (19–19.5)	
1632	Br. 170	*Portrait of Joris de Caullery*, San Francisco		11.7 (11–12) 13.8 (13.5–14)	
1632	Br. 164	*Man Trimming his Quill*, Kassel	{	12.5 (11.5–14) 12.4 (12–13)	
1632	Br. 330	*Portrait of a Young Woman Seated*, Vienna, Akademie	{	12.7 (12–13.5) 12.5 (12–13)	
1632	Br. 167	*Portrait of a Man*, New York	{	13 (11.5–15) 14 (13.5–15)	
1632	Br. 331	*Portrait of a Woman*, New York	{	12 (11–13.5) 14.1 (14–14.5)	
[1632/33]	Br. 494	*Young Woman at her Toilet*, Ottawa		13.4 (13–14) 12 (11.5–12.5)	

▶ Long Description

a536

				THREADCOUNT upper: *vertical threads* lower: *horizontal threads* *(min.–max. found)*	
			┌ canvases presumably from one bolt └ companion pieces with canvases presumably from one bolt		upper symbol: *vertical threads* lower symbol: *horizontal threads* • ○ + *average number of threads/cm* • *presumed warp threads* — *spread of threadcounts* ○ *presumed weft threads* + *warp/weft direction undetermined*
					NUMBER OF THREADS 6 7 8 9 10 11 12 13 14 15 16 17 18 19
1633	Br. 547	*Christ in the Storm*, Boston, Stewart Gardner Museum		*upper strip* 14.3 (13.7–15.5) 15.5 (15.2–15.7) *lower strip* 14.8 (14.2–15.5) 15.4 (15.2–15.5)	
[1633]	Br. 548	*The Raising of the Cross*, Munich	┌	14.7 (14.5–15) 14.6 (13.5–16)	
1633	Br. 173	*Portrait of Johannes Wtenbogaert*, Amsterdam, Rijksmuseum	└	14.8 (14–15.5) 14.6 (13.5–15.2)	
1633	Br. 467	*Bellona*, New York		13 (12.5–13.2) 12.2 (11.5–13)	
1633	Br. 408	*Jan Rijcksen and his Wife*, London, Buckingham Palace		10.7 (10–11.5) 12.7 (12–13.5)	
1633	Br. 172	*Man Rising from his Chair*, Cincinnati, Taft Museum	{	11 (10.4–11.5) 11.5 (11–12)	
[1633]	Br. 341	*Woman in an Armchair*, New York	{	11.3 (10.7–11.5) 12.6 (11.5–13.5)	
[1633]	Br. 171	*Portrait of a Man (Kuel?)*, Kassel		15.3 (14–15.5) 14.7 (14.5–16.5)	
[1632/33]	Br. 405	*Portrait of a Couple*, Boston, Stewart Gardner Museum		*righthand strip* 14.5 (14–15) 13.5 (13–15) *narrow* 15.9 *lefthand strip* 14.5 (14–16)	
[1633]	Br. 406	*Jean Pellicorne and his Son*, London, Wallace Collection		12.8 (12.2–14) 17 (16.2–18)	
[1633]	Br. 407	*Susanna van Collen and her Daughter*, London, Wallace Collection		*upper strip* 14.3 (11.5–16.5) 14.3 (13.5–15.5) *lower strip* 13.4 (12–16.2) 13.5 (13.5–14)	

a537



▶ Long Description

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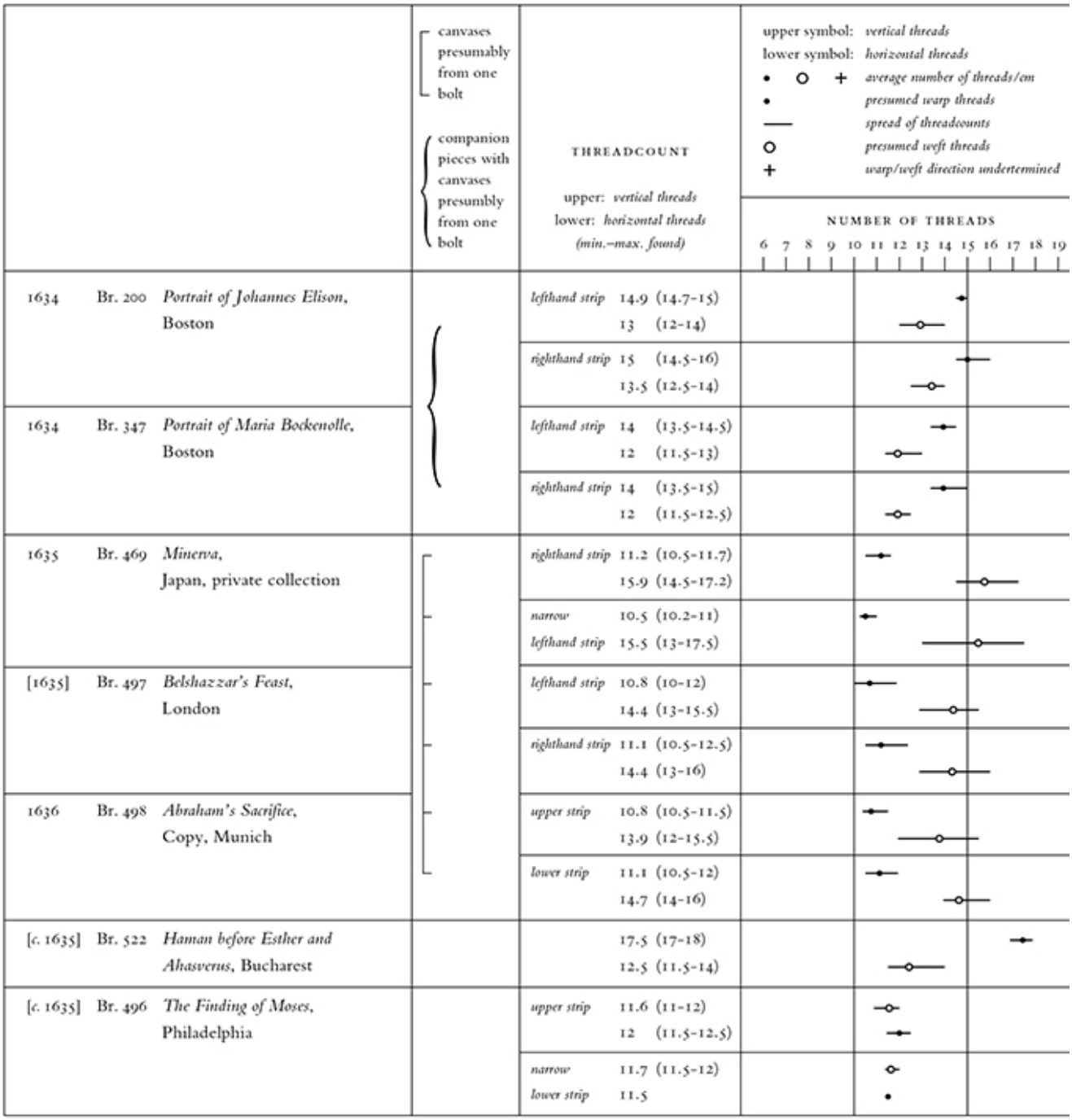

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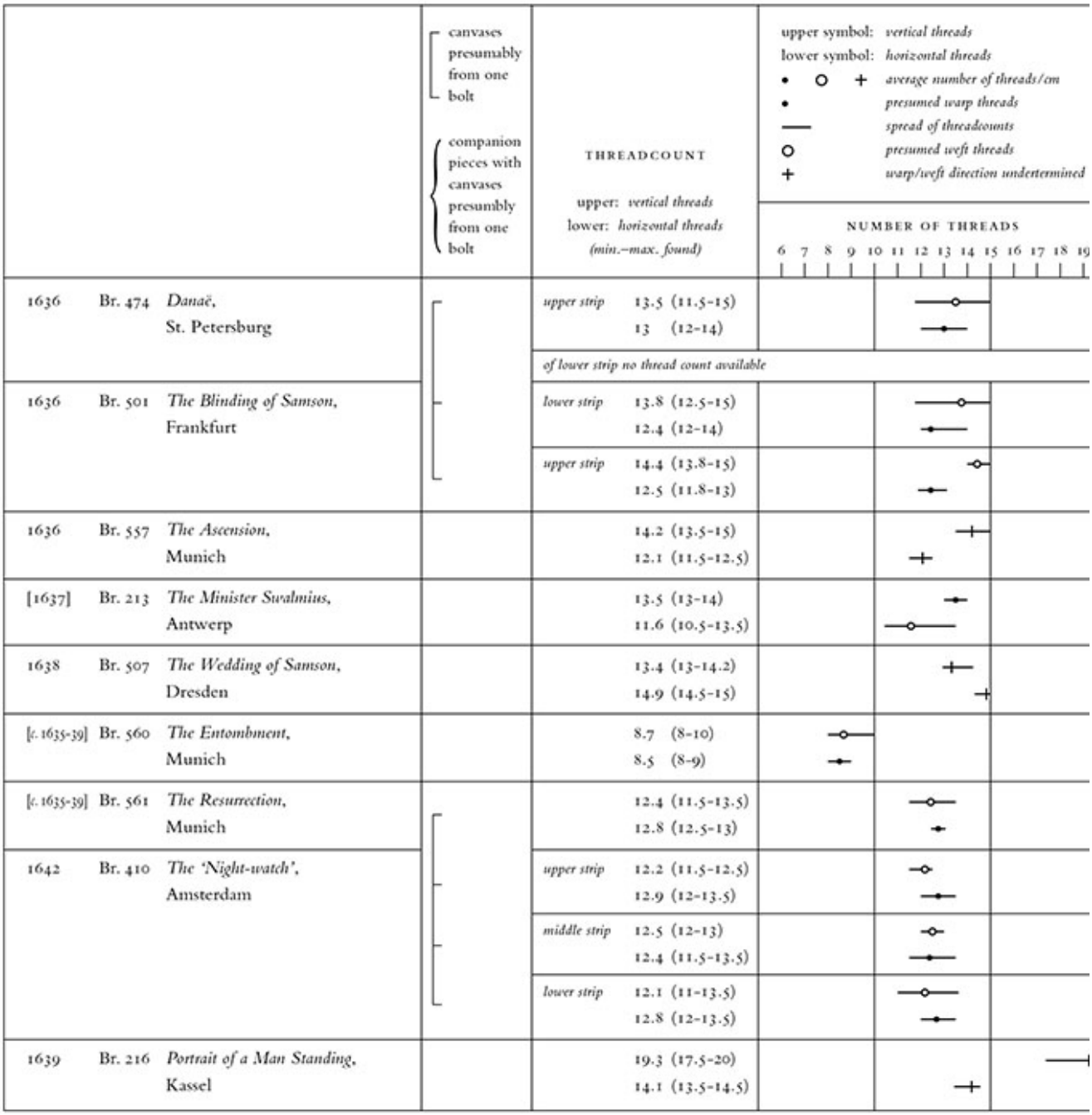


▶ Long Description

a543

			canvases presumably from one bolt / companion pieces with canvases presumably from one bolt	THREADCOUNT upper: *vertical threads* lower: *horizontal threads* *(min.–max. found)*	upper symbol: *vertical threads* lower symbol: *horizontal threads* • ○ + *average number of threads/cm* • *presumed warp threads* — *spread of threadcounts* ○ *presumed weft threads* + *warp/weft direction undetermined*
					NUMBER OF THREADS 6 7 8 9 10 11 12 13 14 15 16 17 18 19
[*c.* 1640]	Br. 439	*The Baptism of the Eunuch*, Hannover		10.8 (10–11.5) 13.4 (13–14.2)	
[*c.* 1639]	Br. 456	*Dead Peacocks*, Amsterdam		*upper strip* 10.5 (9–11.5) 13.9 (13–14.5)	
				lower strip 10 (9–11.5) 13.5 (13–14)	
[?]	Br. 33	*Portrait of Rembrandt*, Ottawa		13.8 (13–16.5) 14.7 (14–16.5)	
1640	Br. 34	*Self-Portrait*, London		15.4 (15–18) 17.9 (17–19)	
1641	Br. 409	*Portrait of Anslo and his wife*, Berlin		15 (13.5–16.5) 18.8 (17.5–20)	
1641	Br. 218	*Portrait of Nicolaes van Bambeeck*, Brussels		12.3 (10.5–13.7) 13.5 (12.5–14.5)	
1641	Br. 360	*Portrait of Agatha Bas*, London, Buckingham Palace		11.5 (10–13) 13.7 (13–14.2)	

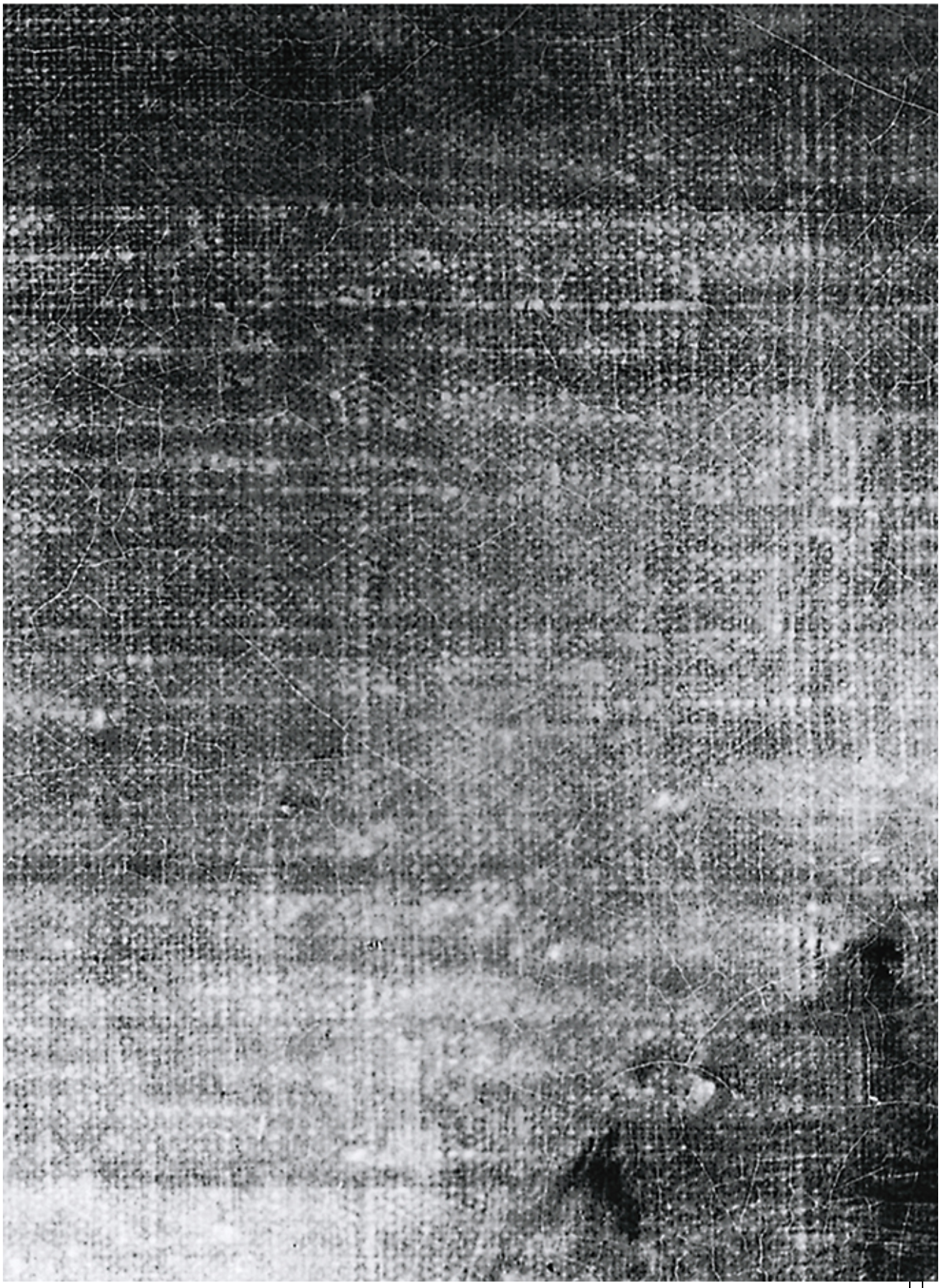
▶ Long Description

In the case of one group of three paintings another opportunity for checking is provided; as was discovered by Greet van Duyn, in all of the strips incorporated in these three large canvases occurs a weaving fault at about 20 cm from the edge (fig.128, p. 101). The paintings in question are *Belshazzar's Feast, Minerva* and *Abraham's Sacrifice* in Munich (fig. 129, see p. 101).

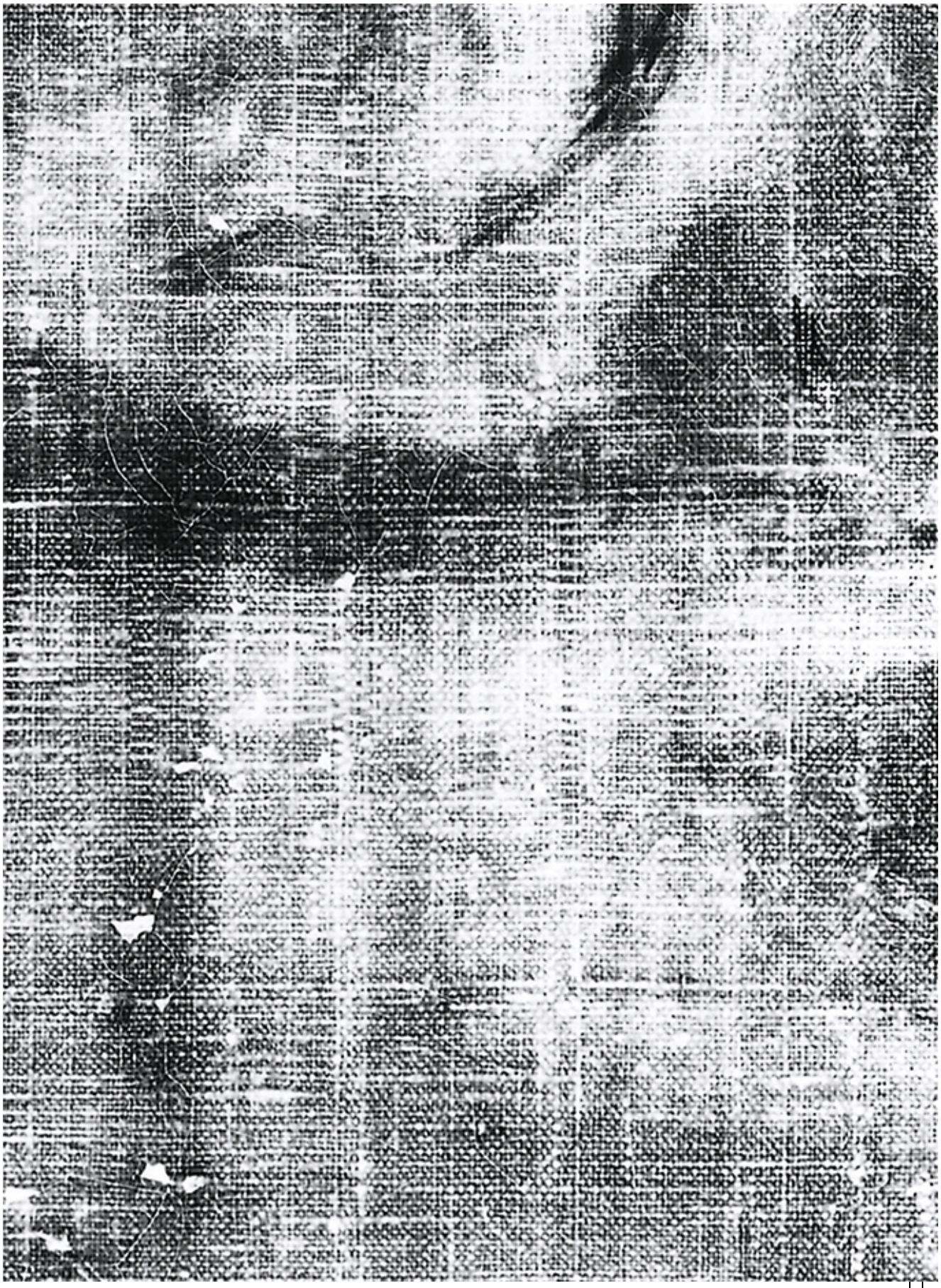
a545

Where canvases have a thread count in common which is moreover well outside the average range of densities encountered, there is a greater certainty that the shared characteristic is significant. An example of this kind is provided by a group of paintings – the *Holy Family*, the *Cupid,* the *Apostle Paul* and *Samson Threatening his Father-in-* a546*law* (see figs. 132-135), together with the two fragments already referred to – in which one finds an unusual difference between the number of warp and weft threads (figs. 130, 131).[58] When the thread count and weave characteristics suggest that two canvases may come from the same bolt, format and strip width can provide supporting evidence: this is true in the case of the *Danaë* and the *Blinding of Samson* (see table C, p. 124 and figs. 158, 159).[59] It is striking – and in itself argues for the supposed common origin of the clusters of canvases indicated as such in table B (see p. 102-107) – that the pairs or groups concerned have invariably been (or can be regarded as having been) painted during the same period.

The fact that these groups are so small disproves the supposition that the canvases used in Rembrandt's workshop came from a limited number of bolts stored in his studio. Written sources, such as seventeenth-century inventories and depictions of artists' workshops, do not provide grounds for this supposition either – bolts of canvas are rarely mentioned and never portrayed in such documents.[60] It is far more probable that the painters bought their canvases, like their panels (see p. 22), already prepared, or had them supplied by the person commissioning a painting. There are a number of sources 109 which show that the latter must not infrequently have been the case.[61] We have evidence suggesting that artists bought their canvases already prepared from craftsmen who specialized in preparing them.[62] The Leiden document of 1676 mentioned on p. 22 suggests that at that time painters were at all events totally dependent on such craftsmen, who could at the same time be frame makers or cabinet makers. Other – some of them much earlier – documents mention the existence of craftsmen referred to as primers.[63] Inventories of studios show the frequent occurrence of loose, i.e. unstretched canvases.[64] From a number of sources relating to Rembrandt one finds the cost of the canvas (and frame) charged separately to the customer,[65] as an amount paid out in advance by the artist. This is in line with the supposition that those commissioning paintings often provided the support. They then dealt themselves with the expenditure involved, and were moreover able to decide the format and quality of the support and the nature of the frame.



figs. 130Detailed X-rays of the *Holy Family*, Munich, Alte Pinakothek (see fig. 132) and *Cupid*, Vaduz, Collections of the Prince of Liechtenstein (see fig. 133), showing canvases coming from the same bolt (positive prints)



a556If such a situation existed, it would be worth investigating canvases used by other Amsterdam painters of the period; this could result in more and larger clusters of canvases from the same bolt used in different studios.

When Von Sonnenburg examined the canvas of a number of Murillo's, the total absence of any connection between the fabrics led him to say that investigating the weave of painters' canvases had hardly anything useful to offer.[66] To a certain extent the facts reviewed above prove him right; yet the very comprehensiveness of the material examined here allows one to attach informative value to the negative results obtained. There are, however, also positive results which, sparse though they are, demonstrate the usefulness of studying the fabric. The first negative result is that the possibility of dating canvases on the basis of thread density used as statistical data, can be discounted. A second negative result is that there is no question of there being a weave typical of a particular studio (in our case, Rembrandt's).

One positive result is that the outcome of this investigation seems to confirm suppositions, prompted by written sources, as to how support material was supplied to the studios. In this respect, the present study can help to provide a picture of how the seventeenth-century artist obtained his materials – one that is still comparatively vague from many points of view.[67]

Study of the canvas also sheds new light on more specific Rembrandt problems. The groups of paintings noted (as being on identical canvas) add to the certainty that the paintings in question did in fact originate in one and the same workshop. This seems at odds with the assumption just made that Rembrandt's Amsterdam contemporaries painted on pieces of canvas coming from the same bolts of cloth that provided the canvases Rembrandt used. It must, however, be regarded as very improbable that, particularly in Rembrandt's first few years in Amsterdam, paintings were produced outside his studio which are stylistically so close to his work that even today they can still be looked on as being from his hand. Thus the Munich copy (with variations) after the St. Petersburg *Abraham's Sacrifice* (Br. 498), for instance, must at all events have been done in Rembrandt's workshop (see figs. 128, 129).

Rembrandt f 1663

fig. 132Rembrandt, *The Holy Family*, c. 1634. Canvas, 193.5 x 123.5 cm. Munich, Alte Pinakothek. The canvas is from the same bolt as figs. 107 (middle strip), 133-136

a560

The fact that groups of canvases were (so far as can be ascertained on the basis of style and inscriptions) produced in the same period provides an opportunity, when faced with dating problems, for cautiously assuming that canvases from the same bolt were painted during the same period. One naturally cannot rule out the possibility of a canvas remaining unused for a longish period, or being completed and signed only at a later stage. To the group of four canvases (the *Holy Family*, the *Cupid*, the *St. Paul* and the *Samson Threatening his Father-inlaw*, figs. 132-135) can, as has already been mentioned, be added two small fragments of canvas that may have been trimmed from the canvas on which the *Cupid* had been painted (figs. 107, 136-137).[68] A discovery like this prompts one to reconsider the dates of these two grisailles, especially in the case of the *Lamentation* (see figs. 136-138), the dating of which has until now varied between 1637 and the mid-40s; a date soon after 1634 cannot be ruled out now and is in fact borne out by stylistic features.

fig. 133Rembrandt, *Cupid Blowing Soap Bubbles*, 1634. Canvas, 74.5 x 92 cm. Vaduz, Collections of the Prince of Liechtenstein. See fig. 132. The absence of cusping along the

lower edge indicates that the canvas as it was primed was larger (see dotted lines). Rembrandt must have cut it to measure before he painted the *Cupid*. Parts of the remaining piece were most probably used for the paintings reproduced in fig. 107 (middle strip) and 137

In certain instances investigation of the fabric can be useful in identifying pendants; thus, the great similarity in thread density and weave characteristics between the canvases of the *Portrait of a Young Woman* in the Vienna Akademie der bildenden Künste and the Kassel *Portrait of a Man Trimming his Quill* confirms the suspicion that they were originally companion-pieces (figs. 139-142, see p. 113).

fig. 134Attr. to Rembrandt, *The Apostle Paul*, c. 1635. Canvas, 126 x 109.4 cm. Vienna, Kunsthistorisches Museum (see fig. 132)

[H2] INTERPRETING CUSPING

a565When unprepared canvas is stretched, the fabric is appreciably distorted by the locally greater stress exerted at points where the canvas is attached to the stretcher (fig. 146). The canvas is stretched more at these places. The nature of this distortion – 'cusping' – and its presence or, indeed, absence, can provide an insight into trade practices and contribute to our knowledge of the physical history of a painting.

fig. 135Rembrandt, *Samson Threatening his Father-in-law*, c. 1635. Canvas, 159 x 131 cm. Berlin, Gemäldegalerie, Staatliche Museen Preussischer Kulturbesitz (see fig. 132)

In radiographs that cover the edges of a painting, cusping is frequently seen. The pitch often varies somewhat, the cusping extends to a varying degree into the body of the canvas

and it may be more or less marked at the edges. In certain cases there may be breaks in the regular succession of curves in the threads. In other cases again cusping may be absent, or, as in one instance discussed later, it may become more and more marked from one corner of a painting to the other.

In order to understand these phenomena it is essential to have some idea of seventeenth-century practices with regard to stretching painters' canvases. Various sources tell us about seventeenth-century methods. First, there is a relatively small group of paintings on canvas where the original method of stretching can still be seen;[69] and secondly there is a considerable number of depictions of studios in which it is possible to make out, more or less clearly, how a canvas was stretched.[70] Thirdly, written sources do, though seldom, provide instructions for stretching.[71] And finally X-rays provide a570information which, though it is generally interpretable only in the light of what we already know from the other sources just mentioned, does, when all is added up together, give deeper insights.

fig. 136Rembrandt, *The Lamentation*, c. 1634. Paper on canvas on panel, 31.9 x 26.7 cm. London, National Gallery. In the course of its genesis, this design on paper for an etching was cut down to an irregular shape and stuck on a scrap piece of canvas, which subsequently has been put on a larger panel. The piece of canvas is part of the canvas on which the *Cupid* (see fig. 133) was painted. Another piece of the same canvas was used for

a first enlargement of *John the Baptist Preaching* (see fig. 107). The complicated genesis of the *Lamentation* is to be explained by Rembrandt's concern with narrative aspects of the biblical story (see Corpus III A 107)

fig. 137Rembrandt, *The Lamentation*. London, National Gallery (see fig. 136). X-ray ('TR' stands for 'top right'). Thin white lines in the central part indicate places where the original paper has been cut away. Relevant for the genesis of the grisaille is the place where Rembrandt added a ladder, referring to the Deposition of Christ, an earlier episode of the story

fig. 138Rembrandt, *The Deposition*. Drawing, 21.6 x 25.3 cm. London, British Museum. The complicated genesis of this drawing proceeded parallel to the equally complicated genesis of the grisaille (figs. 136 and 137). The introduction of the ladder referring to the Descent from the cross took place by cutting the drawing in two pieces, shifting the parts and gluing the pieces accordingly on a new piece of paper. The complications in the genesis of the grisaille (see fig. 136) and this drawing should be seen in connection with narrative problems as to the unity of time in the rendering of a history

Rembrandt tried to include in one single composition a reference to an *earlier* phase of the story (the Descent from the cross) as well as a *future* phase (the return of Joseph of Arimathea after his request to Pilate for permission to bury Christ). Joseph of Arimathea is approaching in the background of the grisaille.

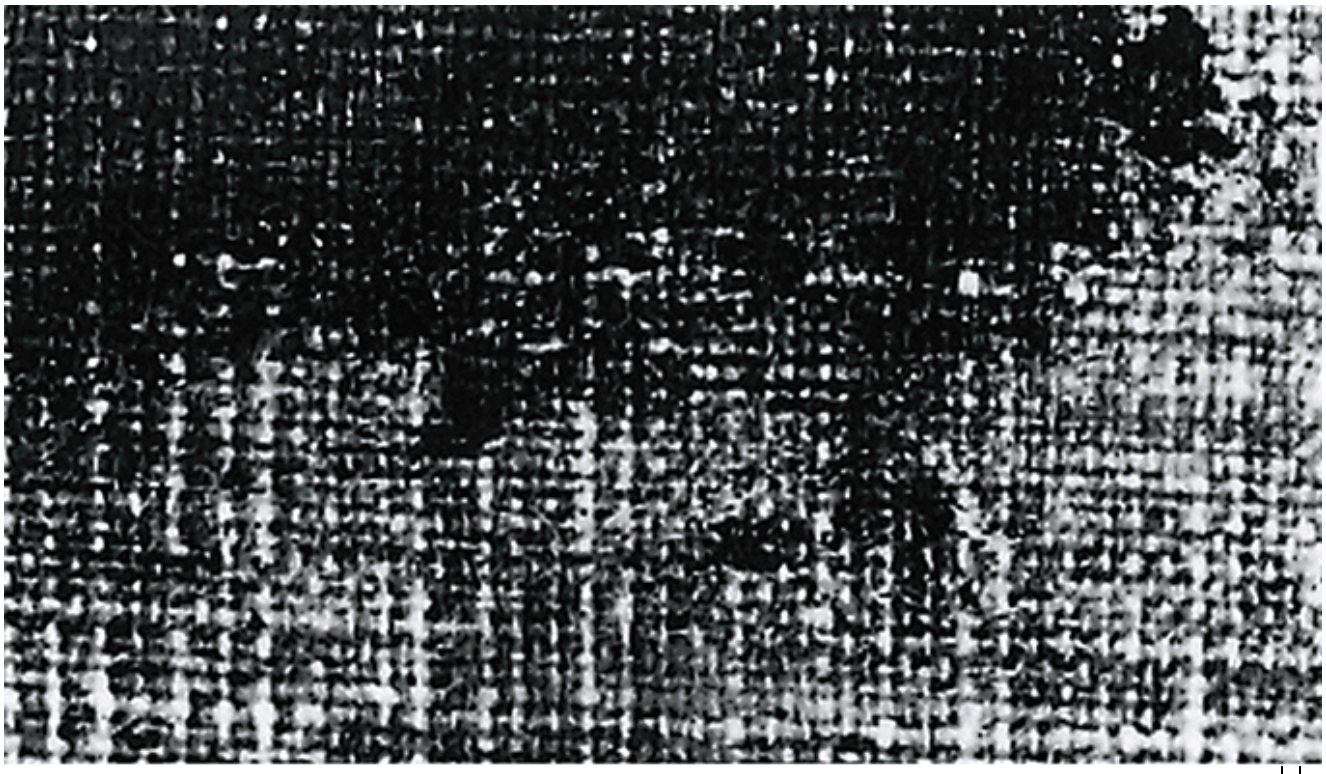


fig. 139Rembrandt, *Portrait of a Man Trimming his Quill*. Kassel, Staatliche Kunstsammlungen (see fig. 141). Detail of X-ray, part of which (hidden behind the stretcher, see fig. 121) shows the weave of the original canvas coming from the same bolt as the presumed companionpiece (see fig. 142). The top left area shows the weave of the lining canvas covered with radio absorbent paint (positive print)

a575

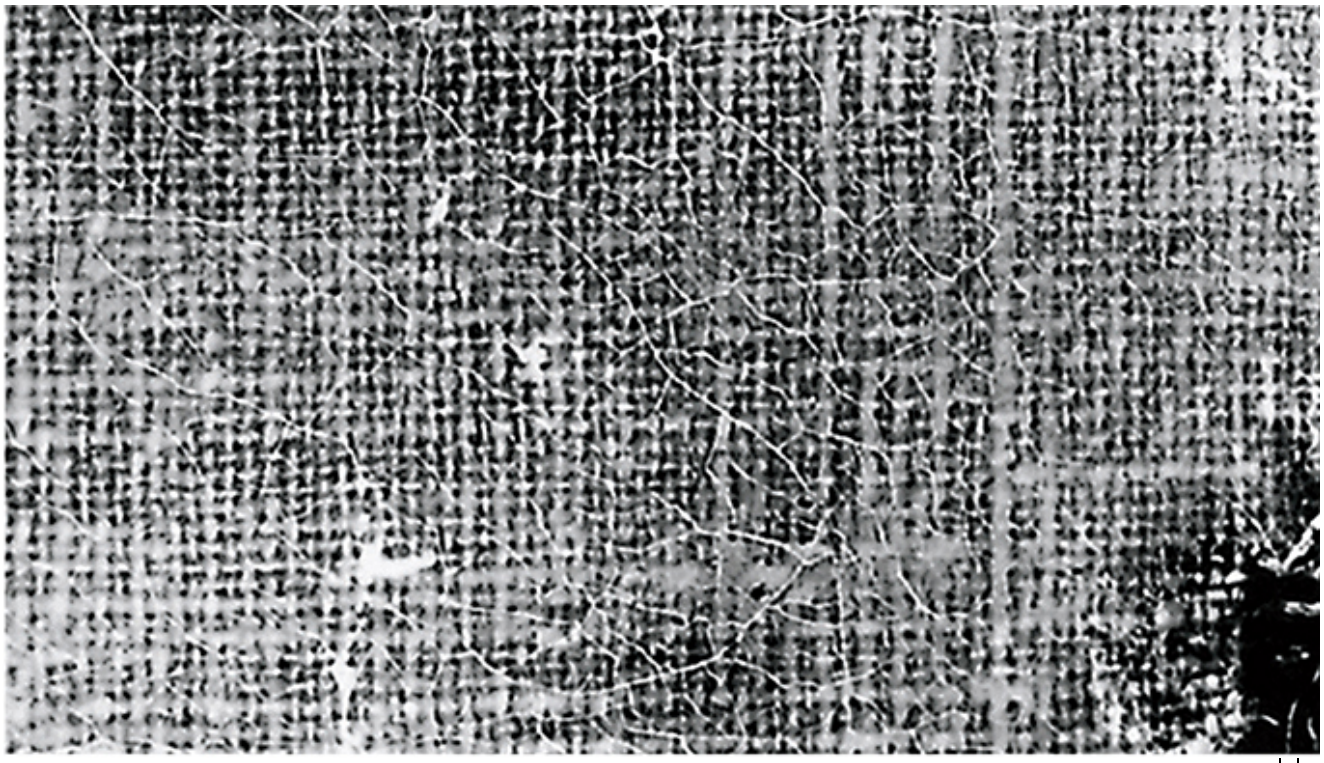


fig. 140Rembrandt, *Portrait of a Woman*. Vienna, Akademie der bildenden Künste (see fig. 142). Detail of X-ray showing canvas coming from the same bolt as the presumed companion-piece (see figs. 139, 141)

fig. 141Rembrandt, *Portrait of a Man Trimming his Quill*, 1632. Canvas, 101.5 x 81.5 cm. *Kassel, Staatliche Museen.*

a578

fig. 142Rembrandt, *Portrait of a Woman*, 1632. Canvas, 92 x 71 cm. Vienna, Akademie der bildenden Künste. The virtual absence of cusping in the canvas of this painting on all sides – providing evidence that the painting has been cut down –, combined with the fact that the Kassel painting (see fig. 141) shows cusping on all sides and has been painted on canvas of the same bolt (see figs. 139, 140), provides strong arguments that the two paintings – both made in 1632 – were originally companion pieces

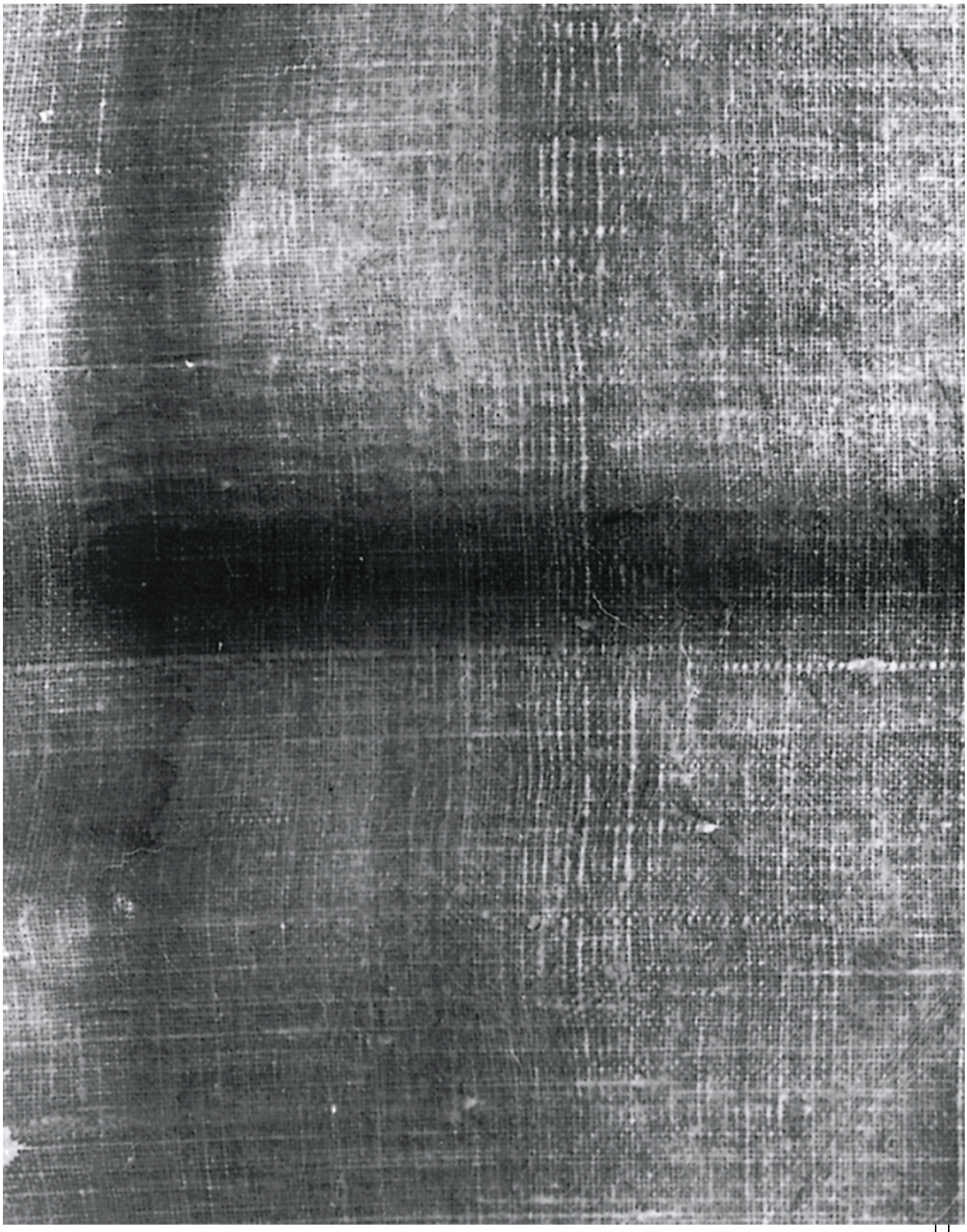


fig. 143Rembrandt, *Portrait of a Couple*. Boston, Isabella Stewart Gardner Museum (Br. 407). Detail of X-ray showing distortion along the edge of a stretched canvas, consisting of both

primary and secondary cusping. The former extends further inwards than the latter (positive print)

As a rule the presence of cusping indicates that the canvas was stretched in an unprepared state and prepared afterwards. When glue and priming were applied, any distortions occurring through tensioning of the canvas that was still stretchable in its unprepared state became fixed in the fabric.

fig. 144Rembrandt, *Portrait of the Shipbuilder Jan Rijcksen and his Wife*, 1633. Canvas, 111 x 166 cm. London, Buckingham Palace. The dotted line indicates the original size of this painting. This reconstruction is based on the absence of cusping along the top and the proportions of the print by J.P. de Frey (see fig. 145)

a582

fig. 145Reproduction print after fig. 144 by J.P. de Frey (etching)

a584Such distortions can be termed 'primary' cusping; it can extend up to c. 25 cm from the point of stress.[72]

When no primary cusping is present on one or more sides chances are that the painting has been reduced in size by later hands. This is sometimes confirmed by the existence of copies or other documents which provide information about the original appearance of the painting, as in the case of the *Portrait of the Shipbuilder and his Wife* (figs. 144, 145). In other cases, peculiarities in the composition add to the suspicion that the painting has been reduced in size on the side where primary cusping is missing, as in the case of the *Danaë* (see figs. 158-161).

In a good many cases this kind of evidence does not convincingly explain the absence of primary cusping. However, it is essential to appreciate that primary cusping occurs at the edges of the canvas only *at the format in which it was primed*. It does not follow, therefore, that these edges have to coincide with the edges of the picture painted on the canvas.

A fair proportion of the available radiographic material shows that in many cases a canvas, primed while stretched in a strainer – a wooden framework larger than the canvas – was indeed used in its entirety for a single painting (because it displays primary cusping all round the edges). Allowance has to be made, however, for the possibility that in other cases

several canvases were cut from a single primed piece of canvas – something which nowadays, with the mechanically primed, factory-made canvas, is a matter of course. In the frequent case where cusping is missing along one or two opposite sides,[73] one may suppose that the canvas was originally part of a larger primed canvas that was cut into two or more pieces, which were subsequently restretched to be painted. The canvas of the *Portrait of Johannes Wtenbogaert* (Br. 173) provides a clue to such a practice. With that canvas the deformation of the fabric along the bottom takes the shape of a single long cusp running from one corner to the other, with no cusping at the top and normal cusping along the sides. This suggests the existence of a method according to which long strips of canvas were primed and subsequently cut from the strip to the desired formats. A stretching method apparently used in such cases had already been described in a sixteenth-century source as a way of producing banners.[74] The method involves stretching the canvas strip between two poles, the short sides being attached only at the corners. This results in the kind of weave deformation described above. Several paintings by Rembrandt, where cusping in the canvas fabric is missing at top and bottom or both sides, may thus have been taken from the middle part of long strips of prepared canvas and subsequently put on other stretchers. The hypothesis that long strips of canvas were primed in one piece has been confirmed by documents found by Xenia Henny in the Rotterdam Municiple Archive (see note 38).

A slight amount of fresh cusping might occur while a primed canvas was restretched for painting; when this was done within a fairly short period, fresh distortion could occur, albeit extending only a few centimetres into the canvas. Obviously, the material used in preparing the canvas did not harden completely for some time. Distortion of this kind can be termed 'secondary' cusping (see fig. 143). In many cases the traces of secondary cusping may a588have been lost when, during lining, the edges of the canvas were trimmed away.

fig. 146G. Dou, *A Painter in his Studio*. Private collection. Detail showing a canvas stretched in an oversize frame

fig. 147V. van der Vinne, *A Painter in his Studio*. Etching

The stretcher as we know it today, with wedge-shaped keys in order to regulate the tension of the canvas, did not exist in the seventeenth century. [75] Prior to 1750, there were other ways of applying and adjusting the tension on a canvas during and after its preparation. Many seventeenth-century pictures show paintings in a studio with the canvas laced by a long cord to a strainer (figs. 146-148). One finds examples of this way of stretching a canvas in depictions of painters at work done by artists from Rembrandt's circle, both from the early period in works by Dou and in the work of one of Rembrandt's later pupils, Aert de Gelder (see fig. 181). There are a number of variants of this method of stretching the canvas; in most cases the cord was merely wrapped round the battens of the framework, in others it was passed over nails or through holes bored in the battens of the strainer (see fig. 148).

Naturally, these strainers could only have a temporary purpose; a painting that was stretched in this fashion obviously needed, if it was to be framed, to be attached to another,

correctly-sized strainer or frame. The function of these oversize strainers must have been to provide a simple and effective way of stretching or restretching a canvas while working. For priming such a device was essential, as the canvas had to stay free of the stretcher bars so that the necessary manipulations with the priming knife (see fig. 167) could be carried out without pushing the canvas against one of the bars, thus damaging the fresh ground layer or even the canvas. For comparable reasons, similar devices are used by restorers to the present day.

fig. 148G. Dou or a painter of his circle, *A Painter in his Studio*, 1637. Private collection. Detail showing a canvas restretched in an oversize frame

a593One has to assume that the strainer served in the first place for *preparing* the canvas in a stretched state,[76] but the depictions of artists at work that have been mentioned make it plain that painters also frequently executed their painting while the canvas was still – or, more likely, *again* – stretched in such an oversize frame. In a depiction of a painter at work ascribed to Gerard Dou, one can plainly see that the cusping in the canvas does not match the holes bored in the frame (see fig. 148). This example may provide further support for the supposition that painters did not prepare their own canvases, but bought them 'loose' from a primer and only temporarily restretched them in oversize strainers.

However, the artist is not seen working with his canvas in this type of strainer in all depictions of studios; often the canvas would seem to be already attached to its final stretcher, though the way in which this is done is usually not very clearly depicted. In a studio scene by the young Dou one can distinguish how the canvas is wrapped round the stretcher from the way the canvas stands up in a small fold at the corners. The pegs or nails used to fasten the canvas are shown by small black dots (fig. 149). This method of pulling the canvas round the edge of the strainer and holding it down with pegs or nails, still in common use today, must therefore already have existed in the seventeenth century,[77] though it was certainly not the only way of fastening a canvas to its final stretcher. In an etching by Rembrandt himself, the *Pygmalion* (fig. 150), one can see on an easel in the background a large canvas for which another stretching method has been used (fig. 151). Cursory though the sketched lines are, it is plain that the painting on the a596easel is on canvas from the way cusping has been indicated, and the way one corner of the canvas is curling forward like a small loose flap. At first sight it seems to be attached to the usual oversize framework, but closer inspection reveals that the outer edge of the strainer is only a little wider than the sides of the canvas itself. It looks as if the canvas is fastened *against* the front surface of the strainer, without either a wrapped-round edge or a space between the inner edge of the stretcher and the canvas. This method was probably in frequent use in the seventeenth century. In the museum at Gouda, and in one or two other collec- tions,[78] there are paintings from the first half of the seventeenth century which have been preserved still attached to their old strainers (fig. 152). With most of these paintings one finds that, just as can be seen with the one on Rembrandt's *Pygmalion* etching, the canvas is held *against* the strainer bars. In the preserved instances this was done by means of one or more laces.[79] Most of the canvases are stretched by a system where the laces are passed from back to front through holes drilled in the frame, threaded through the edge of the canvas and then back through the same hole in the frame; the string then runs to the next drilled hole, is passed through from back to front, and so on (figs. 153, 154). If this method had made the use of an oversize framework for preparing the canvas superfluous, and if all the work on the canvas – from the initial preparation with glue size to the completed painting – could have been done on a strainer like those at Gouda, then the canvas would not have needed to be transferred at any stage, and the absence of cusping would in such cases always point to it having been trimmed at some later time. From examination of the Gouda paintings it was, however, certain in all cases that canvases fastened in this way had first been stretched on another frame, probably the larger priming strainer. The certainty that they had been stretched a second time is founded on the observation that at some places alongside the present lacing holes there are other holes – some still with the paint-smeared remains of string in them – and that the cusping that extends furthest into the body of the canvas is related to these holes. When new lacing holes were made in the canvas to fasten it to its final stretcher, secondary cusping was produced, which spread only a few centimetres into

the fabric.[80] There fore, we see both primary and secondary cusping here, one alongside the other. As has been noted above, the phenomenon was already familiar to us, for it had been observed a number of times on radiographs of Rembrandt paintings, though initially without any possible satisfactory explanation for it (see fig. 143).

fig. 149G. Dou, *A Painter in his Studio*. Private collection. Detail showing a canvas nailed to a stretcher

a601

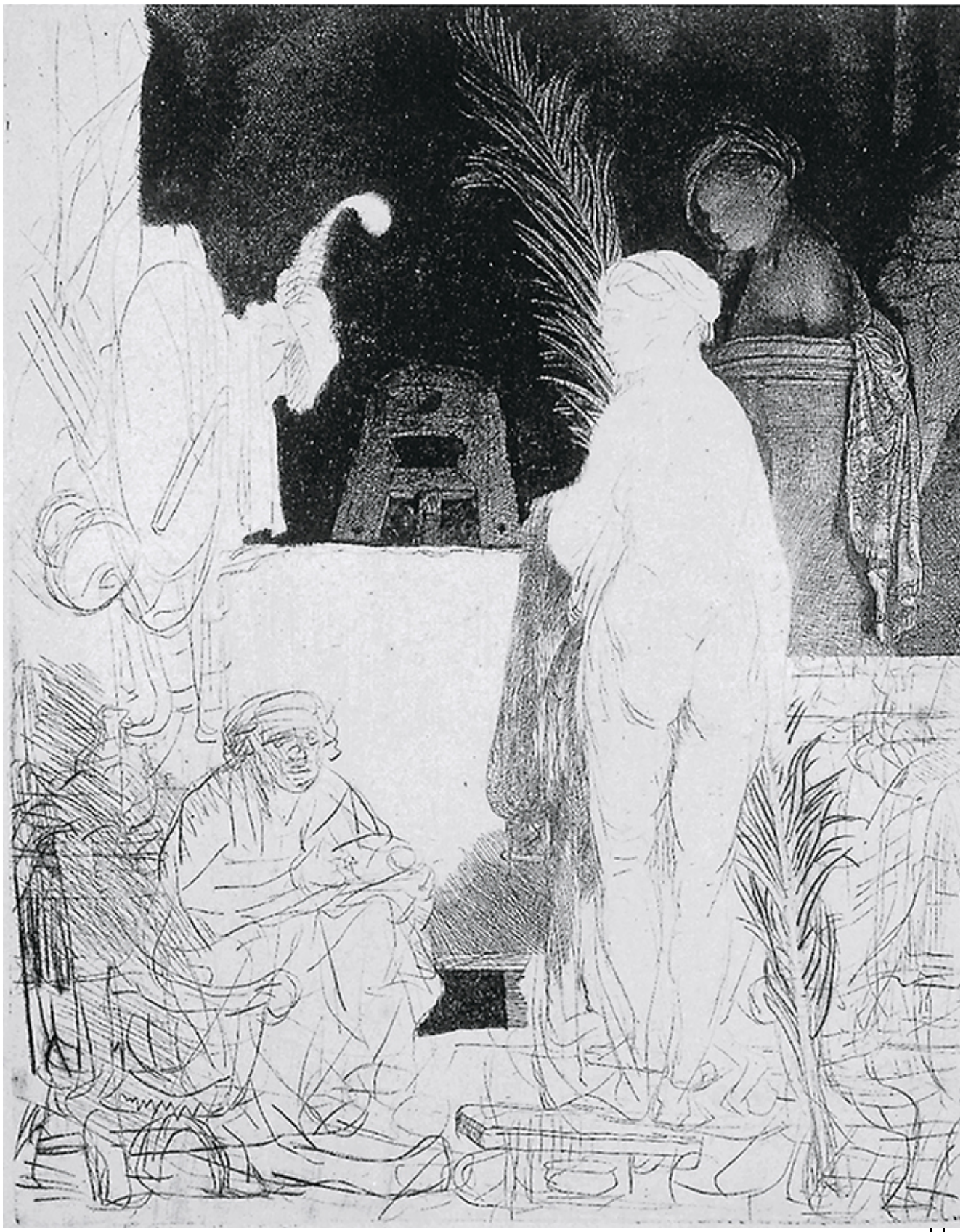


fig. 150Rembrandt, *An Artist Drawing* (the so-called *Pygmalion*). Etching (B 192, second state)

fig. 151Detail of fig. 150, showing the canvas on the easel attached to a slightly larger strainer.

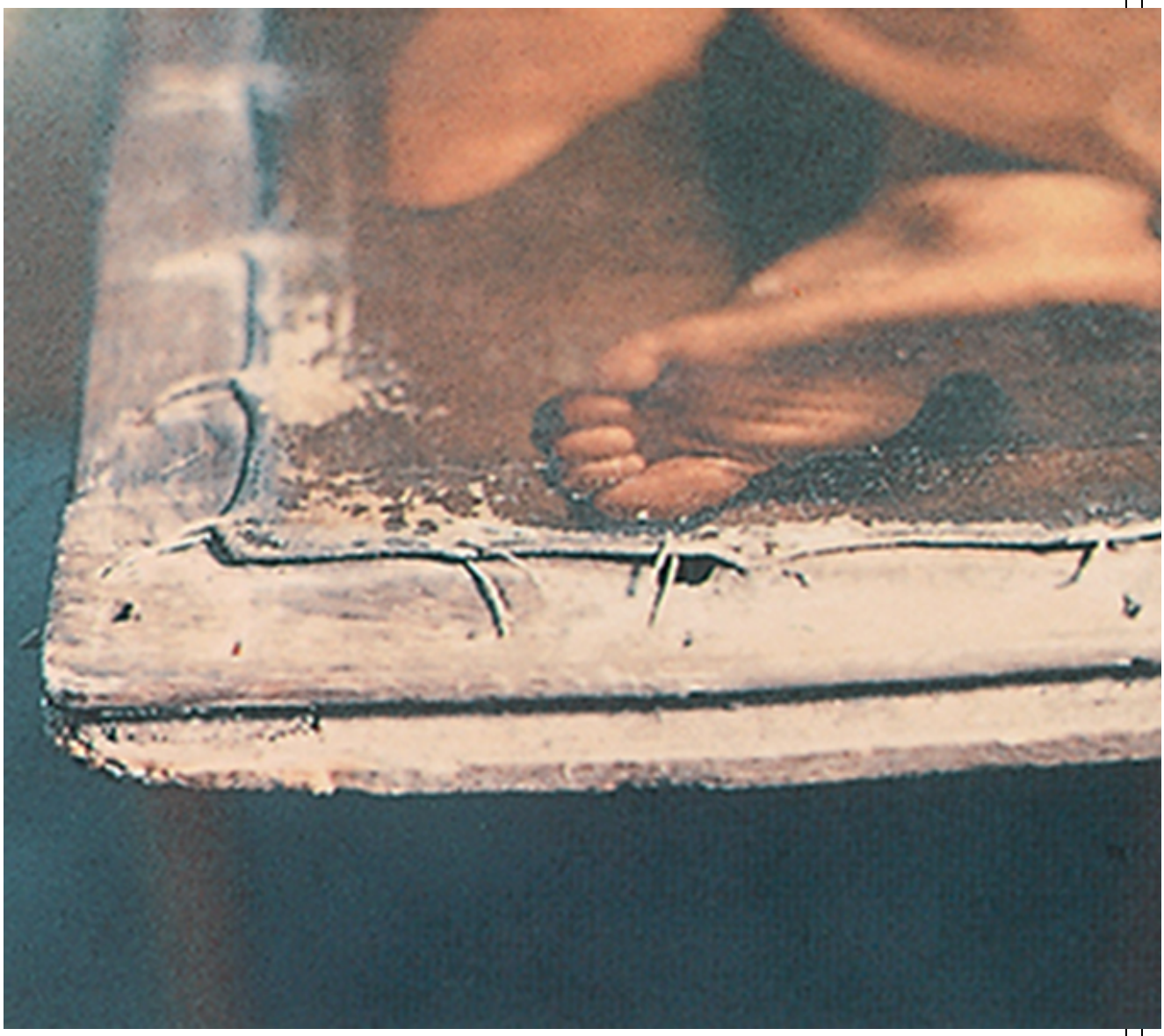


fig. 152Wouter Crabeth II, *Assumption of the Virgin*, 1628. Gouda, Stedelijk Museum Het Catharina- gasthuis. Detail showing a canvas attached to its original stretcher with a partly original lacing string (compare fig. 151)

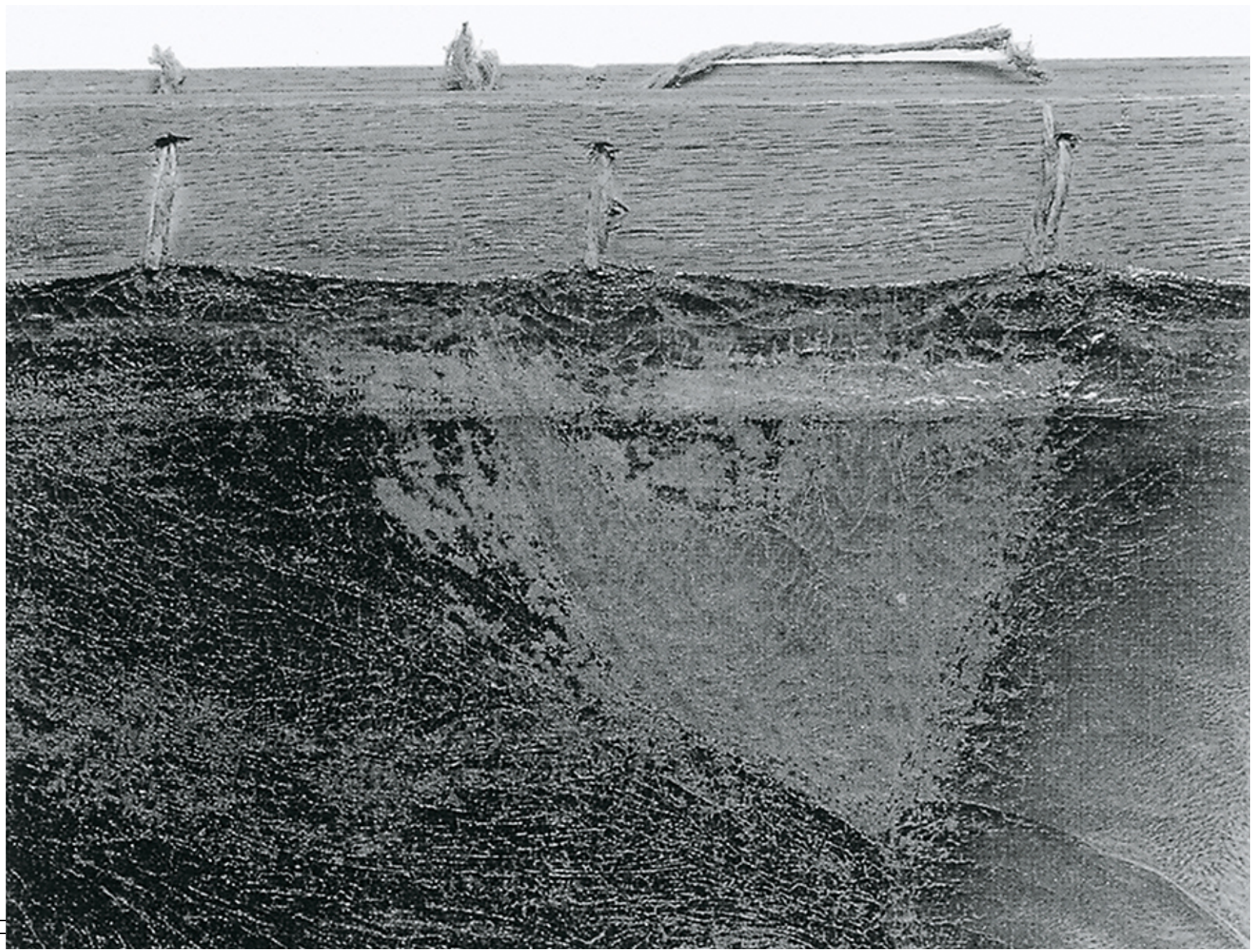


fig. 153Detail of fig. 152. Note primary stretching holes and deformations just above the present holes

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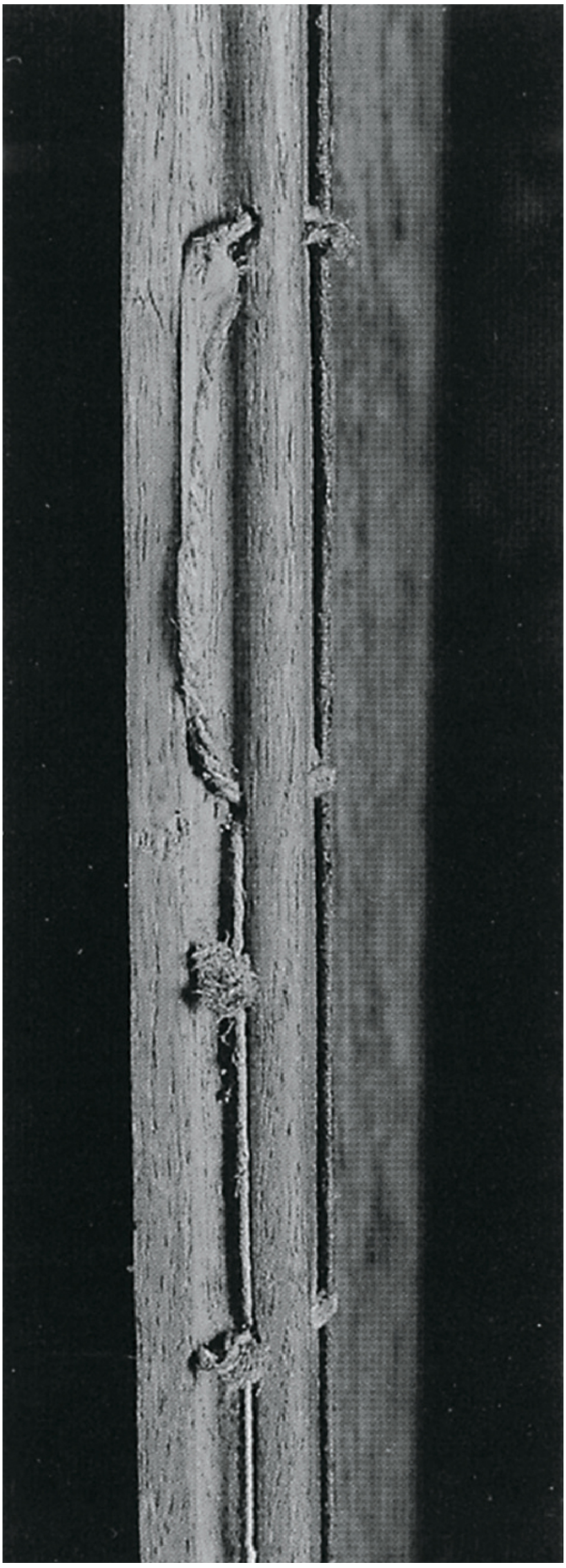

fig. 154Side-view of fig. 153

The Gouda paintings allow us to reconstruct the process by which the canvases were transferred. One finds that the places where the holes were drilled through the bars depended on the holes already present in the canvas.[81] A number of times one can still see the marks that obviously served to ensure that the holes made in the frame were matched correctly (fig. 155). Secondary cusp- ing is thus found to occur only incidentally in those cases where during the lacing-up of the canvas there was an offset at one or two edges, compared to the holes already drilled. On two Rembrandt paintings one can still observe that the edges were originally not wrapped round the edge of the strainer bar (fig. 156).[82] The *Pygmalion* etching seems in this regard to illustrate what actually happened in Rembrandt's workshop. In most cases (especially after the invention of the key-wedge stretcher) these 'flat' edges would, during a subsequent restretching, have had to be pulled round the bars of a slightly smaller frame.

fig. 155Anonymous, *The Annunciation*, about 1630. Gouda, Stedelijk Museum Het Catharina-gast- huis. Detail showing scores in the stretcher bar marking the places where holes were to be drilled corresponding to the original lacing holes of the canvas. (The nail is not original.)

a611

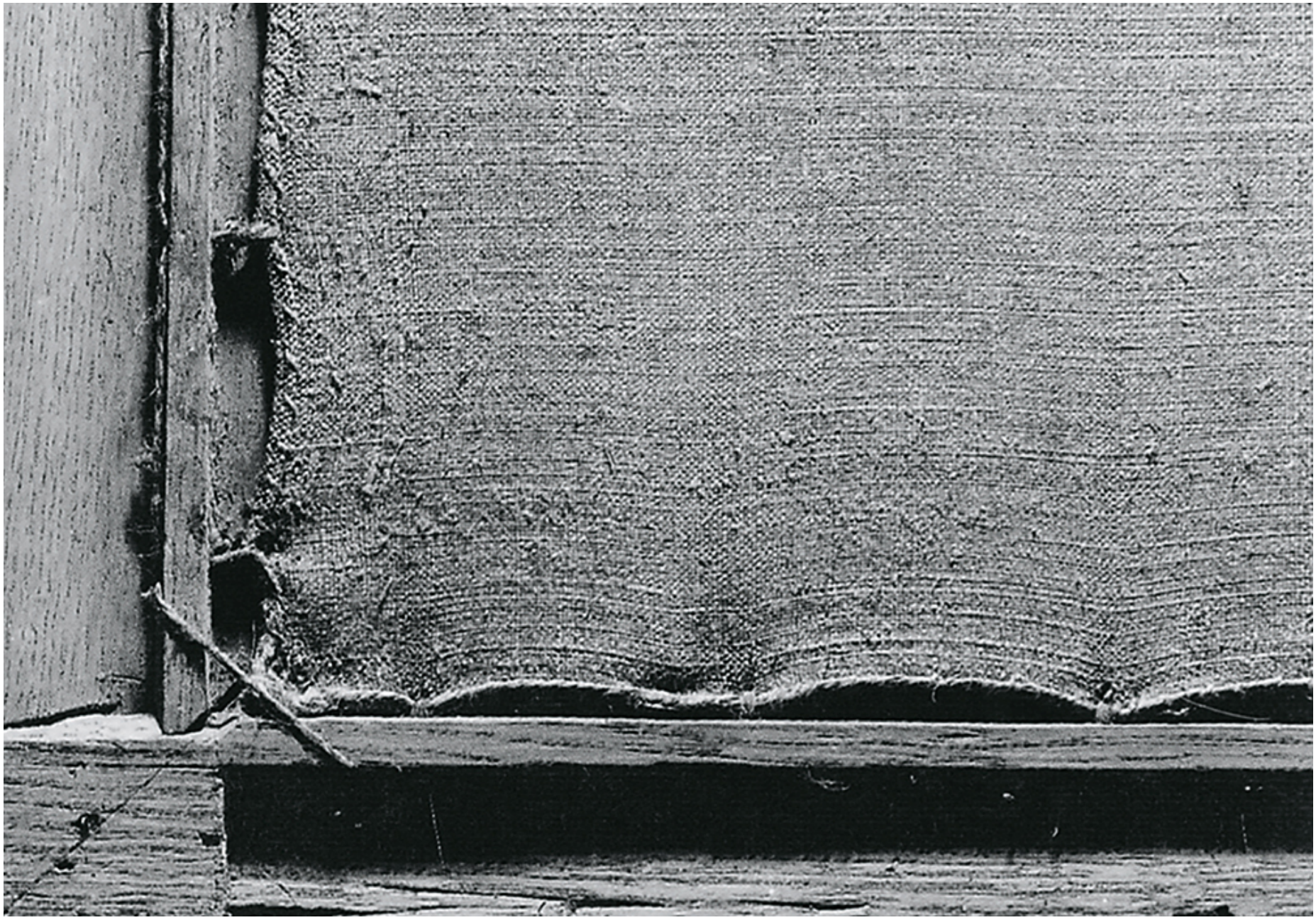

fig. 156Rembrandt, *Jacob Blessing the Sons of Joseph.* Kassel, Staatliche Kunstsammlungen (see fig. 211). Detail X-ray showing the selvedge of a canvas that was never folded over a stretcher (positive print)

fig. 157Northern Netherlandish school, *Portrait of Dirck Hendricksz. van Swieten*, 1626. *Amsterdam, Rijksmuseum. Detail showing a canvas stretched in its frame without using a separate stretcher.*

Apart from the method described above of attaching the canvas to its final stretcher, there was also a method that made no use of a separate stretcher. So far four instances are known (all from the first years of the a614seventeenth century) in which the canvas, after it was painted, was stretched *in* the frame itself. [83] In this method small holes were drilled in a profile at the back of the frame, and the laces were tensioned through these (fig. 157). With one of these paintings, which is entirely undisturbed, it is clear from the presence of secondary cusping that the canvas had first been tensioned in a different frame for application of the ground and during the painting (probably the usual oversize strainer).

[H2] STRIP WIDTHS AND PAINTING FORMATS

In discussing the formats of paintings on canvas and the strip widths that were worked on, one again has to make allowance for the fact that almost no painting on canvas still has its original edges, since for a long time it used to be the custom to trim away the edges of a painting wrapped round the stretcher when the painting was lined (see note 21). Therefore, when talking about the original format of a canvas as it was used by a painter, one must as a rule add on at least a few centimetres to the present-day dimensions. Consequently selvedges recognizable as such are extremely rare (see fig. 156). One might find them also on either side of the seams, where the original edges were stitched to each other 'butted'.[84] In all probability, however, the edges of strips of canvas were usually folded back when they were stitched together, and so the selvedges are no longer visible in the radiograph. As a result, one can only conjecture when talking about the strip widths used in making the canvases.

When arranging the material in order, as in table C, distinct groups become visible. By far the largest group shows that strips of canvas of around or somewhat over one metre in width are common. This dimension could very well match an original strip width of c. 107 cm, i.e. 1½ *ell*. This width is very often found in seventeenth- and eighteenth-century bedsheets, and must therefore have been a common one.[85] The *ell* was the measurement normally used for fabrics.[86]

Surveying the painting formats shown in table C, one finds that this strip width was apparently often employed either single or double, indicating that the canvas primers

preferred, when deciding on the size of canvases, to be guided by the full strip width available (used either single or double). Looked at from the economic viewpoint, such a choice is understandable, because a loss of material would be avoided as much as possible. It comes as something of a surprise that the dimensions of a painting were governed partly by the width of a weaver's loom.

The way in which the strip of cloth was made into the support could vary (see table C). The latter's length or width could correspond to the width of the original strip, and the warp could accordingly run widthwise or lengthwise. With large paintings one often finds two full strip widths sewn together, with the seam lengthwise or width-wise (Br. 547, 200, 347, 474, 497, 501). A further group of paintings exists where a full strip width and a narrower strip of the same kind of canvas have been stitched together (Br. 406, 407, 456). In this case, therefore, there has been a loss of material unless the remainder of the strip was utilized elsewhere (see figs. 133, 136, 107).

table C a621A survey of canvases used for paintings by or attributed to Rembrandt 1631-42, arranged according to strip-width

PRESUMED STANDARD STRIP-WIDTH		MEASUREMENTS IN CENTIMETRES		
		Per strip in weft direction (in case of more than one strip the first number refers to the more intact one)		In warp direction
c. 70 cm ('1 ell')	Br. 200 *Portrait of Joh. Elison*, Boston	61.5	61.5	200
	Br. 347 *Portrait of Maria Bockenolle*, Boston	61.5	61.5	200
	Br. 609 *The Apostle Peter*, Stockholm	66.2		81.3
c. 85 cm ('1¼ ell')	Br. 547 *Christ in the Storm*, Isabella Stewart Gardner Museum, Boston	80	80	128
c. 107 cm ('1½ ell')	Br. 467 *Bellona*, New York	96		126
	Br. 172 *Man Rising from his Chair*, Taft Museum, Cincinnati	98.5		124
	Br. 341 *Woman in an Armchair*, New York	100.5		126.2
	Br. 456 *Dead Peacocks*, Amsterdam	101	41.5	134.8
	Br. 407 *Susanna van Collen and her Daughter*, Wallace Coll., London	101.7	53.3	123 (+ ...)
	Br. 170 *Portrait of Joris de Caullery*, San Francisco	102.5		83.8
	Br. 501 *The Blinding of Samson*, Frankfurt	103	103	276
	Br. 497 *Belshazzar's Feast*, London	104.5	104.5	167
	Br. 173 *Portrait of Joh. Wtenbogaert*, Dalmeny House, Coll. Earl of Rosebery	105		123
	Br. 474 *Danaë*, Leningrad	100 (+ *c.* 5)	85 (+ *c.* 20)	203
	Br. 164 *Man Trimming his Quill*, Kassel	101.5 (+ *c.* 4)		81.5 (+ *c.* 4)
	Br. 330 *Portrait of a Young Woman Seated*, Akademie, Vienna	92 (+ *c.* 14)		71 (+ *c.* 14)
	Br. 498 (copy) *Abraham's Sacrifice*, Munich	106	89	132.3
	Br. 405 *Portrait of a Couple*, Isabella Steward Gardner Museum, Boston	106.5	3	132.2
	Br. 469 *Minerva*, private collection, Japan	107	9	137
	Br. 498 *Abraham's Sacrifice*, Leningrad	108	85.5	132.8
	Br. 494 *Young Woman at her Toilet*, Ottawa	108.5		92.5
	Br. 218 *Portrait of Nicolaes van Bambeeck*, Brussels	108.8		83.3
	Br. 360 *Portrait of Agatha Bas*, Buckingham Palace, London	104 (+ ...)		82 (+ ...)
c. 140 cm ('2 ell')	Br. 406 *Jean Pellicorne and his Son*, Wallace Coll., London	122.5 (+ ...)		155
	Br. 544 *The Holy Family*, Munich	123.5		183.5
	Br. 169 *Man in Oriental Dress*, New York	124		152.5
	Br. 408 *Portrait of Jan Rijcksen and Griet Jans*, Buckingham Palace, London	111 (+ 17)		166
	Br. 499 *Samson Threatening his Father-in-law*, Berlin	131 (+ 2)		159 (+ 2)
	Br. 410 *'The Night-Watch'*, Amsterdam	140	115.5 (+ 24.5) 107 (+ 33)	438
c. 175 cm ('2½ ell')	Br. 403 *Anatomy Lesson*, The Hague	169.5		216.5
	Br. 409 *Portrait of Anslo and his Wife*, Berlin	173.5		207.5
c. 210 cm ('3 ell')	Br. 522 *Haman before Esther and Ahasuerus*, Bucharest	187.5 (+ ...)		234.8

table C. Included are only canvases where the weft direction can be established with a reasonable amount of certainty and where at least one strip has kept its original width (or nearly so). Small losses along the edges including selvedges are normal and detract from the reliability of the information given. Where external evidence points to a subtantial loss of part of the original width, the estimated loss is given in brackets. Measurements in the warp directions are given in order to indicate the entire picture's size.

a622For another small group of paintings one may assume that the supports were cut from bolts of canvas with a width of c. 140 cm (table C). From examination of the *Night Watch*, of which one horizontal strip is still intact, we know that the strip width of 140 cm, or 2 ells, was also used. In its original format the *Night Watch* probably consisted of three strips

140 cm wide. Therefore the format corresponded to a multiple of full strip widths here as well.

Much narrower strips are also encountered. In the portraits of Johannes Elison and Maria Bockenolle (see figs. 164-165), both of which have a vertical seam down the middle, strips of canvas have been used that cannot have been much wider than 70 cm, or 1 ell. In the *Christ in the Storm* (see fig. 187), with a horizontal seam down the middle, the strips of canvas cannot have been much wider than 85 cm, which amounts to $^{5}/4$ ell or 3 Amsterdam feet. This corresponds to a strip width that was called '*breeddoek*' (broadcloth) and was commonly used in sailmaking.[87]

Occasionally one comes across very wide strips of canvas with a plain weave. In the *Anatomy Lesson ofDrTulp* (see fig. 250) and the *Portrait of Cornelis Anslo and His Wife* (Br. 409) the present width of the strips of canvas used is 169.5 and 172 cm respectively. Possibly strips measuring 2½ ells (i.e. about 175 cm) were employed. The widest strip of canvas found in a painting from Rembrandt's workshop measures 190 cm, and occurs in the Bucharest *Haman before Esther and Ahasuerus* (Br. 522). In view of the composition of the painting and the nature of the cusping, this canvas must have been even wider, perhaps 210 cm ($_{=}$ 3 ells), a strip width that was also employed in the *Claudius Civilis* (Br. 482) which is on twill cloth (see note 17).

Knowledge of standard strip widths is useful in cases where one suspects that a painting no longer has its original format, so as to hazard a guess, because of the presumed strip widths, at the width of the missing fragment. On the basis of the position of the seam in the canvas of the *Danaë* (fig. 159), for instance, an accurate estimate could be made of the width of the parts of the canvas missing at the top and bottom. In making such a reconstruction there is of course also other evidence that plays a role (figs. 158-161).

With the London *Belshazzar's Feast* (figs. 129, 162) the cuspings become shallower from one corner to the other along all sides, while the widths of the two canvases incorporated in the support differ at the top and bottom and the seam is slightly oblique (see fig. 129). It is obvious that wedge-shaped strips have been trimmed off around it, so that the whole composition is tilted by several degrees. When reconstructing the original position of the canvas one finds that the table depicted comes to a horizontal position and the wine pours vertically from the beaker of the woman on the right (figs. 162, 163).

If the paintings are grouped by format there is every indication that – just as with the panels – there were standard sizes of canvas. A frequently encountered format measures about 125 cm by about 100 cm (probably originally c. 107 cm). Another group measures c. 100 cm (probably originally 107 cm) x c. 80 cm. Another small group measures c. 210 cm by 135 cm (probably originally c. 140 cm), and another of c. 155 cm x c. 130 cm (cf. table C).

figs. 158Reconstruction of the original height of the *Danaë* (St. Petersburg, Hermitage; Br. 522) based on the conclusion that the canvas comes from the same bolt as that of the *Blinding of Samson* (Frankfurt, Städelsches Kunstinstitut, 206 x 276 cm). The canvas of the *Blinding of Samson* shows primary cusping on all four sides indicating that the painting still has virtually its original size. The horizontal lines in the middle indicate the seams in both canvases. The original strip width must have been 1.5 ell (c. 107 cm), the most common strip width with Rembrandt's canvases

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Speculations about standard sizes of canvas are more problematical than in the case of panels, where the traces of work on the back can often provide the answer whether the panel still has its original size (see p. 1214). The groups of sizes assembled here are thus hardly more than an attempt to demonstrate the clustering of sizes. We know from South Netherlandish sources that standard sizes for canvases were used there, but in the North Netherlands one finds scant information relating expressly to canvases in this respect.[88]

Though the foregoing suggests that a direct connection exists between standard strip widths and standard canvas sizes, one finds that canvases were sometimes not taken from what would have been the natural choice of strip width. There are canvases which could have been taken quite simply from one single strip, but instead have been assembled from two narrower strips. Most remarkable in this respect are the portraits of the Elison couple, where both supports, 123 cm wide, are assembled from two narrow vertical strips sewn together (figs. 164, 165). In this connection one ought to realize that prices of wider strips of canvas were progressively higher.[89]

Using relatively narrow strips in the large canvases made up of several such strips (cf. table C, p. 124), entails the presence of seams in the paintings. Not infrequently these

seams run through the heads of the subjects of the portraits or through main figures in history paintings, indicating that the artist must hardly have been aware of the existence of the seams as he worked (fig. 166). The way in which the canvases were primed probably made seams quite invisible.

As chance has it, what is probably the only written seventeenth-century evidence concerning seams in paintings on canvas relates to Rembrandt himself. When Antonio Ruffo in 1662 complained that the *Alexander* he had commissioned had pieces added on all sides causing obvious seams, Rembrandt replied that there was no need at all for the seams to spoil the effect if the painting was hung in the proper light.[90] In this case, according to the correspondence between Rembrandt and Ruffo, it is a629obvious that the enlargements were made during the course of the work, and the seams were impossible to conceal entirely. Where canvases were joined together before being primed, the seams are – with well- preserved, unlined or very carefully lined canvases – even after hundreds of years, scarcely visible at the front surface. And yet it is plain from the fact that with obviously important portrait commissions (such as the *Anatomy Lesson of Dr Tulp* (see fig. 250) and the *Portrait of Cornelis Anslo and His Wife* (Br. 409) exceptionally large canvases were taken from a single piece, and that importance was attached to having a canvas without seams. In advertisements from the period in which full-width paintings on canvas were used to cover the walls of a a630room, one finds strips of canvas of extraordinary widths (of six ells, c. four meters) being boasted of. [91] But then, in the early eighteenth century, the technique of painting on canvas had been practised long enough for the fact to be realized that a seam can eventually, through a combination of factors connected with ageing, become very obtrusive.

fig. 160Workshop of Rembrandt, *Isaac Denying Esau his Blessing*, c.1640. Panel, 57.3 x 69.6 cm. Private collection. This painting is an example of a pupil's work based on a prototype by Rembrandt (see fig. 159) in which in a given setting another subject is depicted

fig. 161Reconstruction of the *Danaë* on the basis of canvas research and with help of the studio derivate (see fig. 160)

fig. 162Rembrandt, *Belshazzar's Feast*, c. 1635. Canvas, 167.6 x 209.2 cm. London, National Gallery

fig. 163Rembrandt, *Belshazzar's Feast*. London, National Gallery (see fig. 162). Reconstruction in its original position and format

Rembrandt ft 163

fig. 164Rembrandt, *Portrait of Johannes Elison*, 1634. Canvas, 200 x 61.5 cm. Boston, Museum of Fine Arts

fig. 165Rembrandt, *Portrait of Maria Bockenolle* (companion piece to fig. 164), 1634. Canvas, 200 x 61.5 cm. Boston, Museum of Fine Arts

fig. 166Detail of X-ray of fig. 165 showing a seam of the canvas running through the head of the woman

Investigations into the properties of painted canvases – thread density, weave characteristics, cusping, strip width and painting formats – open up unexpected possibilities of obtaining information on the genesis, history and not seldom on the original composition of a cut-down picture. This kind of research requires, however, painstaking and time-consuming analysis of numerous radiographs. One can only hope that such art historian's 'geology' may, as is already the case with dendrochronology, eventually become accepted practice, as only then the significance of the data collected will gain its full weight.

[H2] SOME REMARKS ON THE GROUNDS OF REMBRANDT'S CANVASES

a640How much care was devoted to the preparation of the canvas before the actual ground was applied can be read from a detailed description in a seventeenthcentury Italian manuscript from c. 1680. This description also shows why the preparation of canvases became a separate craft:

> *First, you must be told that the canvas must be good, strong, smooth, and well made; that it must be prepared with a thin ground, and must be so durable as to last as long as the picture, and it is the duty of him who buys the canvas to ascertain this, for if the canvas is bad it decays in short time. Smooth canvas requires but little ground for priming, for if the priming be too thick, the colours become black from the abundance of oil which is used, and the repetition of so many primings; wherefore you must take good canvas, stretch it on the frame, and give it a coat of glue made of the parings of very young pigs' skins, that it may be softer, for such glues as parchment glue, being strong and harsh, cause a certain shrinking of the canvas, which has a bad effect, therefore do as I teach you. When this coat is dry, polish it with pumice stone, give it another coat of glue, as before, and let it neither be too weak nor too strong; for if too weak it will not defend the canvas from the oil, and if too strong it will cause the colour to crack; that which is of the proper consistence will be soft like jelly when it is cooled.*[92]

Only after these preliminary steps the ground was applied. This was done with a primer's knife (figs. 167, 168).

It is remarkable that Rembrandt (probably like many of his contemporaries), when painting on panel, worked with a yellowish ground, whereas when he was using a canvas support the ground was usually a grey colour, especially in the first Amsterdam period. Since the ground plays an important part during work on the monochrome preparatory phase of the painting, deadcoloured paintings on the two types of support must have been quite different in appearance. Research on the Rembrandts in The Metropolitan Museum, New York, has also made it clear that the paint used for the underpainting on a canvas generally contained a good deal of black, unlike the translucent brownish paint used on a panel.[93] One has to suppose therefore that the deadcoloured painting tended, in the case of canvases, to a grey range (see fig. 264), while with panels the monochrome image had a brownish range (see fig. 26). The explanation for the use of a different ground colour for canvases as compared to the traditional panels may lie in the fact that at the same time painting on

canvas was introduced into the Netherlands, recipes for grounds developed in Italy were imported.[94] When preparing panels, on the other hand, the Netherlands had developed their own custom of using 'flesh colour' i.e. warm- tinted, grounds.[95]

Equally noteworthy is the fact that most grounds on canvas, as analyzed from the first ten years of Rembrandt's Amsterdam period, were built up from two layers of different colours, both with oil as a binding a645medium – the lower always comprising a red ochre, the upper a mixture of lead white with a black pigment; a grey surface thus resulted (fig. 169). The first idea that comes to mind is that this combination of layers was intended to achieve a certain colour effect, with a warm tint showing through a cooler one. Yet it can be seen, from paintings that are in a sound condition, that the grey top layer is applied so opaquely that an effect of this kind just cannot occur. One possible explanation for this procedure is that a cheap ochre as the principal component of the material used for closing up the structure of the canvas brought a substantial saving in cost, as lead white was a great deal more expensive.[96]

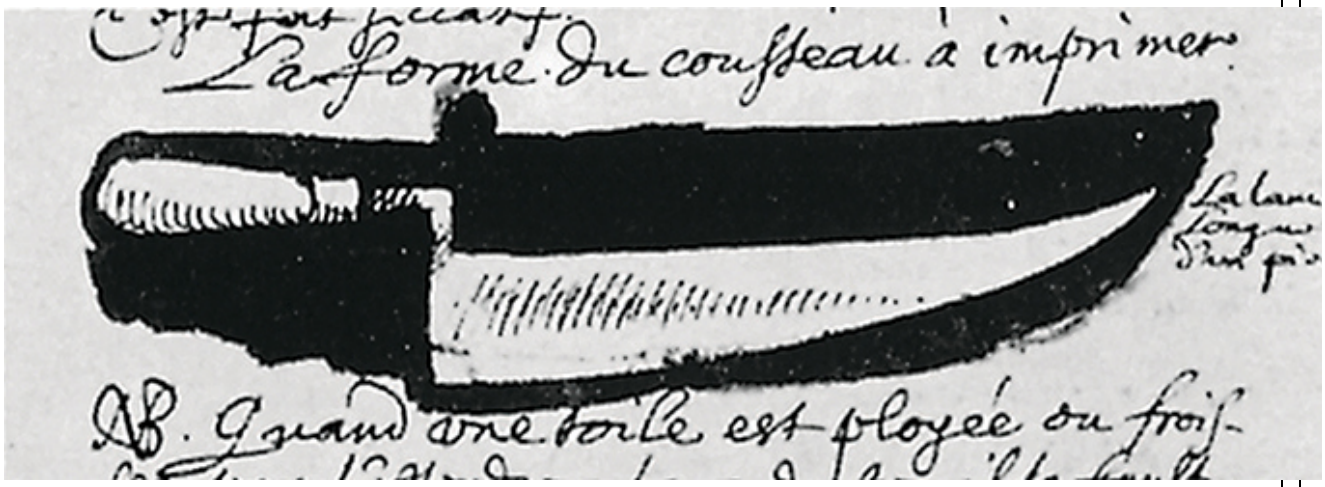

fig. 167Primer's knife as drawn in the Mayerne Manuscript, 1620-1649. London, British Museum

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fig. 167aRembrandt, *Oil sketch for the Göteborg Falconer (St. Bavo)* (detail), c. 1659. Canvas, 68.5 x 55.5 cm. Kopenhagen, Statensmuseum

While painting this life size sketch Rembrandt left the greyish ground exposed in many parts. This ground is of the quarz type (a mixture of milled sand, clay and oil). The composition of this ground proves that the painting was produced in Rembrandt's studio (see the second Preface to this book, p. xi), an argument which contributed to the reasons for reattributing this painting to Rembrandt after it had long been considered to be a later imitation.

The investigation of the grounds of Rembrandt's paintings with respect to their optical function, their stability and various economic and technical considerations is still in its beginning stages. Only if answers to these questions are obtainable can we understand why

in the later paintings by Rembrandt one-layer quartz grounds and other types of grounds are found.

fig. 168David Teniers, *Studio Scene with Monkeys*, c. 1635. Private collection. In the background a canvas is being primed with a rounded priming knife (see fig. 167). As a source on the seventeenthcentury studio practice this painting should be used with caution as its satyrical connotations may also apply to some of the technical details

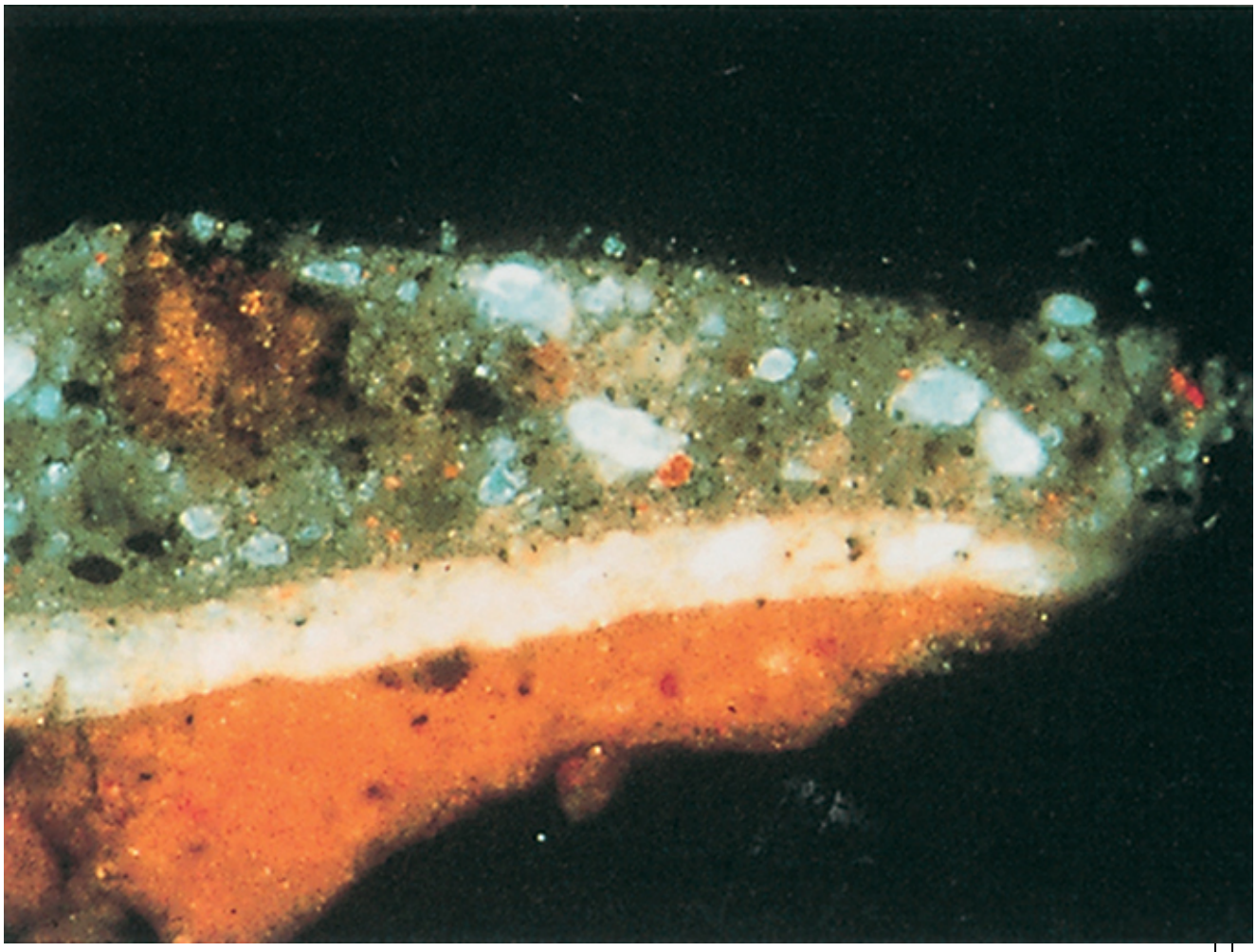

fig. 169Rembrandt, *Bellona*. New York, Metropolitan Museum (see fig. 185). Cross-section of a sample taken in the background (near the right-hand edge). Of the two ground layers, the lower is reddish and is seen to fill the relief of the fabric. The top layer of the ground appears whitish but is actually grey

[h1] VI The Palette; on the Relationship between Style and Painting Technique

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Ernst van de Wetering

a653

fig. 170Rembrandt, *SelfPortrait*, 1660. Canvas, 111 x 90 cm (Detail). Paris, Musée du Louvre. Besides his palette with some brushes, Rembrandt is also holding a maulstick. This implement was held in the left hand and placed on or against the edge of the panel or canvas. The right hand could then lean on it when a steady hand was required for painting certain details (see also figs. 168, 179, 180)

'*There he stood, when everything was on the canvas; but then he shook his head.*' [1] This passage occurs in a description of Rembrandt while painting the *Night Watch* (see fig. 245). It

was written in 1906 by the most respected Dutch artist of the second half of the nineteenth century, Jozef Israëls (fig. 171). Why Rembrandt shook his head, will soon become clear. The next thing he did will be the theme of this chapter.

fig. 171Jozef Israëls (1824-1911) at his easel

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Jozef Israëls speaking of Rembrandt as if he were in his presence, is not the same as a similar passage in just any historical novel about Rembrandt. Jozef Israëls was seen by his contemporaries as a reincarnation of Rembrandt. In 1893, the painter and art critic Jan Veth wrote: *'Rembrandt's great pathos* a658*seems to be resurrected in Jozef Israëls.'* [2] In 1895, the Dutch illustrator Johan Braakensiek even portrayed Rembrandt and Jozef Israëls together in a scene in which Rembrandt is putting a laurel wreath on the 70-year-old Israëls and is about to shake his hand (fig. 172).[3]

fig. 172Johan Braakensiek, Lithograph, 1895, with the caption: *On the occasion of Jozef Israël's birthday celebration, rembrandt: "On behalf of the Dutch art world I pay thee homage".*

But why did Rembrandt shake his head in front of the *Night Watch*? Because, according to Jozef Israëls: *'In his opinion the two men [Banning Cocq and Ruytenburgh] did not yet come forward into the foreground.'* Next we have the privilege of seeing Rembrandt at work, through the eyes of Joseph Israëls:

> *Then he took up his large palette again, dipped his thickest brushes deep into the paint, and once again took on these two front figures with powerful strokes; here more depth, there more light. In this way he put everything to the test, in order to give an even more powerful relief to what needed to stand out. Then he saw that it was good, and that is how he left it.*[4]

This description of Rembrandt at work evokes a very convincing image. But it is an image of Jozef Israëls at work, not Rembrandt!

Why wouldn't Rembrandt, too, have dipped *'his thickest brushes deep into the paint'* of the *'large palette'*, picked up again for that purpose, to resume working on his painting after he surveyed the whole and noticed that it was not good yet? After all, we can hardly imagine a painter working any other way. Yet Israëls was quite off the mark with his apparently convincing image, for Rembrandt did not have a large palette. He had a small palette and no doubt more than one (see fig. 102). And his palette was not right at hand in the sense that any passage in a painting could at any time, if necessary, be *'taken on once again with powerful strokes'.* At first this may seem to be just a triviality. But there are major consequences to that triviality which could lead someone (this happened to me, at least) to look at Rembrandt's paintings – and at the work of all the other seventeenth-century painters – with new eyes.

It would be a truism to state again that we are hardly able to see Dutch seventeenthcentury art except through the filter of the nineteenth century. But it has been proven time and again how very hard it is to correct our image of that art by freeing ourselves of anachronistic, mainly nineteenthcentury, notions.

It is precisely in stylistic terms, where the use of pictorial means is concerned, that we almost inevitably judge seventeenthcentury art through the filter of the nineteenth century, all the more so because a663many nineteenth-century artists (and not just Dutch artists) were strongly influenced by seventeenth-century Dutch painting. That is certainly true of a painter such as Jozef Israëls. In his article, quoted at the beginning of this chapter, he tells how much of his development as a painter was defined by his discovery of Rembrandt: *'He was the master who stood above all.'* But of course it is not true that Israëls – and his younger contemporaries of the Hague School and Dutch Impressionism – were merely late epigones of Rembrandt. Their pursuit of a form of painting based on subtle modulation of tonal qualities and a fluid, sometimes rough handling of paint had its own momentum. Jan Veth, in the article quoted above, wrote correctly that despite all the affinity, Jozef Israëls did not actually paint the way Rembrandt did.[5]

At first it would seem that Rembrandt had the same pictorial aims as Jozef Israëls would have two centuries later. I am referring mainly to Rembrandt's effort to give his paintings and etchings a strong degree of pictorial unity, based on subtle manipulation of the strong light effects and of the tonal qualities. Yet anyone who in his imagination places a work by Jozef Israëls next to a Rembrandt – picture a late Rembrandt, such as the *Jewish Bride*, beside Jozef Israëls' *Jewish Wedding* (figs. 173, 174) – will be struck by the enormous difference in the results of their common pursuit of unity in the tonal structure of the painting. Exaggerating

slightly, one could say that the unity achieved by Jozef Israëls is characterized by a certain degree of 'muddiness', in which all of the colours can be found more or less all over. The Scottish painter Sir George Reid, who in 1871 took lessons from Israëls, wrote in one of his letters home, *'...never in my life have I seen such muddling as is practised here. Israëls is the king of muddlers'.*[6] By contrast, one is struck by the fact that Rembrandt's work is defined by such a degree of clarity in the pictorial structure and especially by such an important role for the local colours, that in this sense, surprisingly, his style appears to be much closer to Raphael's, for instance (see fig. 207), than to Jozef Israëls'. My hypothesis is that this can largely be traced to a matter of technique: specifically, the use of the palette.

The idea that there would be a relationship between style and technique – not only in the art of painting – is not at all novel. In times when stylistic changes in art were seen mainly in terms of progress, it was obvious that the features of older styles could be explained as resulting from technical handicaps which had since been overcome. When during the nineteenth and early twentieth century the conviction arose that every style had its own legitimacy and that within each style period masterpieces could be created, the link between style and restrictions in technique was no longer seen as obvious. Eventually, a form of art-historical reasoning developed, which culminated in Riegl's *Kunstwollen*. Alois Riegl (1858-1905) saw style as the manifestation of an inherent urge to form, which is separate from the restrictive influence of such factors as materials and technique.[7] For that matter, Riegl's view was diametrically opposed to ideas developed by preceding theoreticians on this point. Gottfried Semper (1803-1879) and Viollet-le-Duc (1814-1879) in particular had claimed there was a fundamental interrelationship between style and technique.[8] Riegl did not entirely ignore the influence of technique. He believed, however, that *Kunstwollen* would overcome the limitations of technique. Technical limitations, considered by Semper to play a positive part in the creative process, constituted in Riegl's view no more than a *'coefficient of friction'* within the *Gesamtprodukt* of *Kunstwollen* (the total result of the inherent urge to form).[9] The degree to which Rembrandt's style may have been influenced by aspects of his technique will be investigated here especially with regard to his use of the palette.

fig. 173Rembrandt, *The Jewish Bride*, c. 1665. Canvas, 121.5 x 166.5 cm. Amsterdam, Rijksmuseum

a670

[h2] Selective Palettes

One of the most fascinating and complete documents concerning the history of oil painting is the well-known print by Jan Baptist Collaert (1566-1628) after the Flemish artist, living in Italy, Johannes Stradanus (1523-1605). This engraving dates from about 1580 and is part of a series of prints devoted to inventions not known in classical antiquity, the so-called *Nova Reperta*, published in Antwerp (fig. 175).[10]

The print gives a highly detailed picture of a673an idealized painter's studio: the master is working on a history piece, while an assistant is occupied with painting a portrait. Two other assistants are grinding and preparing colours.

fig. 174Jozef Israëls, *Jewish Wedding,* 1903. Canvas, 137 x 148 cm. Amsterdam, Rijksmuseum

The countless details in the print provide valuable information as to daily practice in the late sixteenth-century painter's studio. In the foreground, three boy apprentices can be seen: the youngest one is practicing a675the rudiments of drawing (see also fig. 56). The more advanced apprentice on the left is drawing from a plaster cast.

fig. 175Jan Baptist Collaert (I566-1628), after Johannes Stradanus, *Color Olivi*, c. 1590. Engraving. Part of the series *Nova Reperta.*

For our present purposes, the boy wearing the smock standing next to the master is of particular interest (fig. 176). He is setting a palette with paint taken from shells, presumably containing colours prepared by the assistants at their grinding slabs, and holds a palette similar to that of the master. As will soon be made clear, the arrangement of the master's palette with only four colours is far from arbitrary. Like so many other details of the print, this should be regarded as a faithful representation of sixteenth-century practice. The palette the youth in the foreground holds, contains a limited number of colours as well. As on his master's palette, they are spread out over the entire surface of the palette. The first thought that arises is that this youth is preparing his palette so that he can begin to paint, and therefore he is a more advanced student than the other two. However, the didactic completeness of the print does not make this assumption very convincing. There is no third easel with a painting to be seen on the print. So what is the boy doing?

On most routine activities of the painter's studio there are generally no written sources to be found. Incidental evidence on certain aspects of painterly practice can be gleaned from documents, but we have to live with the fact that such sources are relatively scarce in both time and place. In the present case, a late-seventeenth-century Italian text may turn out to relate to the activities depicted on Collaert's Antwerp print of a hundred years earlier. Furthermore, I believe both sources to a677be of significance when answering questions about the studio practice of a seventeenthcentury Dutch painter like Rembrandt. Using

available sources in this way is, of course, only justifiable when the phenomenon being investigated is widespread and displays a certain constancy. The considerable mobility of painters in the sixteenth a678and seventeenth centuries provided many opportunities for the spreading of painting techniques and procedures. Many young painters travelled across Europe and worked in the studios of various masters for shorter or longer periods – a similar situation still exists in the international restoration world. This form of mobility guarantees a quick circulation of knowledge and experience, leading to a high level of international uniformity in knowledge and practices of the craft. Some aspects of studio practice, such as the shape of the palette, will, as we shall see later on, change all over Europe, owing to innovations in the studios. Other aspects, such as the phenomenon discussed here, will prove to show great constancy. Bearing this in mind, one might venture a cautious guess as to what the youth with the smock is doing in the studio on Collaert's print, by referring to a passage from the Volpato manuscript, a text by Giovanni Battista Volpato (born in 1633), dating from somewhere around 1680, and written in the form of a series of dialogues. It contains the following exchange between F., an older painter's apprentice, and Silvio, a younger apprentice.

fig. 176Detail of fig. 175

Silvio'*Tell me, if you will, whether you set your master's palette?*'

F'*Surely (...) It suffices for him to tell me what he intends to paint, for then I know which colours I must place on the palette.'* [11]

The print, together with this text, provides clues which as yet have not been given consideration in the literature on historical painting techniques. They suggest that painters formerly used a palette which was set with a group of colours specifically for *'what he [the master] intends to paint',* in other words, for a certain part of his painting. This implies that such a palette did not include all the available pigments, but only those necessary to paint that specific part of the painting.

This understanding of the situation has a far-reaching consequence: one must see the seventeenth-century (but also earlier or later) painting as a composite image made up of interlocking passages, comparable to the *giornate*, the successively executed 'daily portions' in fresco painting, although in the case of oil painting, a number of passages would generally have been completed on a given day; on the table next to the youth with the smock, a clean palette is depicted, which is apparently ready to be set with colours. In using such a method, already hinted at in Chapter II, the seventeenthcentury way of painting differed fundamentally from paintings developed as a tonal entity such as those by Josef Israëls, who used a palette with a full range of colours and with a mixing area covered with patches of mixed paint, of which the tone and colour could be further modified (fig. 177). At first the idea of earlier artists working in *giornate* as described above, may seem highly exaggerated. After all, we know that the great majority of seventeenth-century painters, and certainly Rembrandt, did in fact set up their painting as a tonal unity by means of a predominantly monochrome underpainting (see Chapters II andVIII). The issue here, though, is that in developing the painting on the basis of the 'dead colour', islands of modulated local colour are joined together on the underpainted design of the work. Such a method of working is determined by the material, technical, and economic limitations inherent in oil painting, limitations that only vanished (and were sub- a681sequently forgotten) with the introduction of ready-to-use, mutually compatible, industrially manufactured paint that comes out of a tube.[12]

ÖLMALEREI

K. WEHLTE

OTTO MAIER VERLAG
RAVENSBURG

fig. 177A twentieth-century palette. Cover photograph of Kurt Wehlte, *Ölmalerei* (Ravensburg, 1963 [1928])

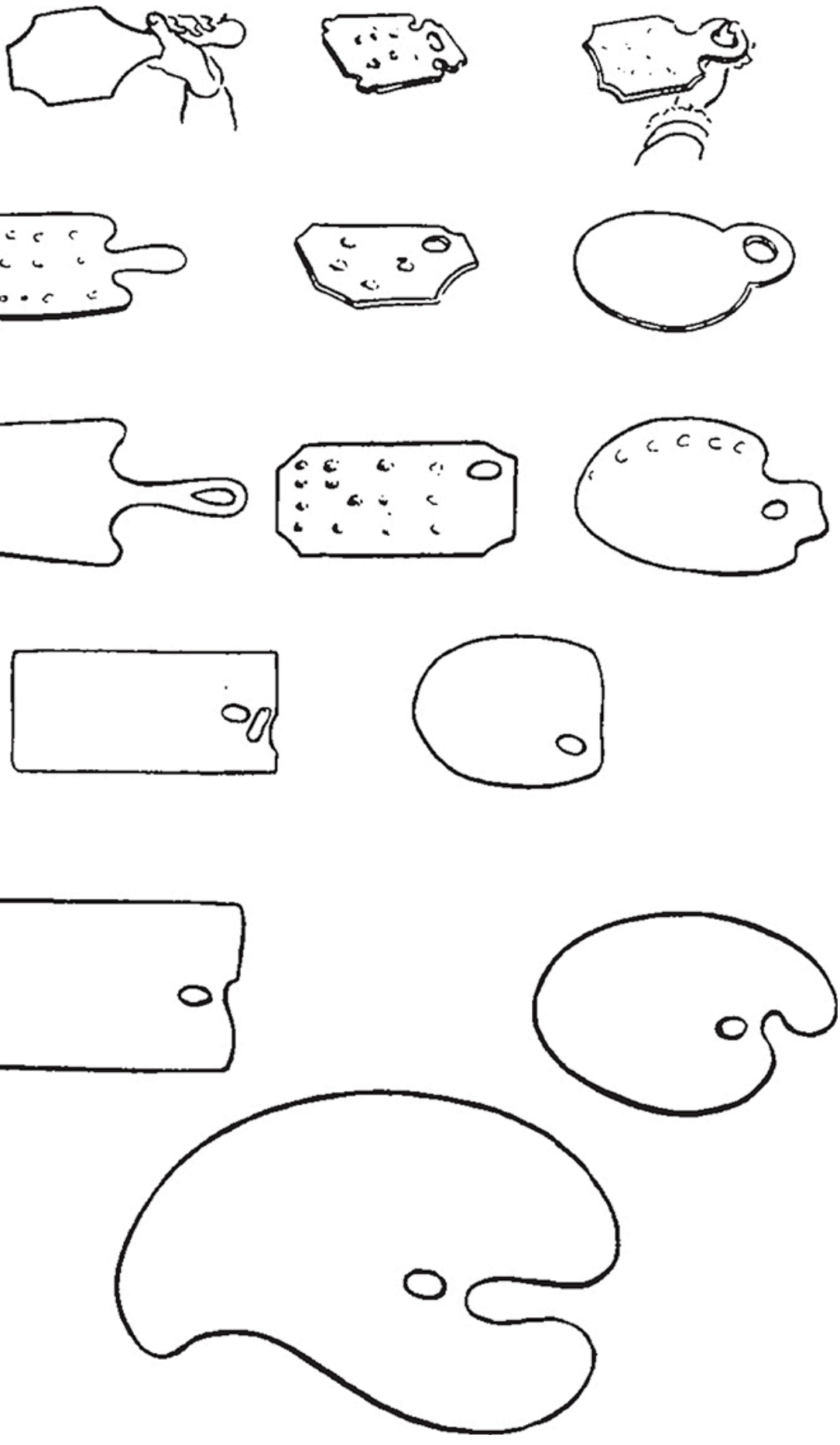

fig. 178A survey of the history of the palette as reproduced in J.R. Gettens and G. Stout, *Painting Materials*, New York, 1966 (1942), p. 302

[h2] The Development of the Palette as a Tool

Many depictions of painters at work have survived. Initially St. Luke painting the Madonna was portrayed predominantly. These paintings must contain reliable information with regard to the studio practices of the period in which they were created, or otherwise the contemporary viewer would not have recognized the representation. The same applies to the palettes shown in these paintings. When analyzing a large random sample of palettes depicted in paintings, such consistency emerged in the shape and the arrangement of the paint that one may safely argue that no well-trained painter would think of painting a fake palette.[13]

Generally speaking and based on studio scenes, it can be stated that prior to 1400 painters worked with separate paint trays, a687each of which held prepared paint of one colour or hue. The first depictions of palettes stem from about 1400 (fig. 178). They most closely resemble bread boards with a handle, used by the painter to hold the palette. Someone must have come up with the idea of making a hole in the handle that would be big enough to put one's left thumb through. The advantage of this innovation is obvious: it enabled the painter to support the palette easily in a horizontal position on the thumb; he could then hold other tools (including the maulstick while painting) with the remaining fingers of the same hand. Next we see that the hole is no longer found in a handle-like protrusion from the palette, but that it is situated in the flat of the palette itself.

fig. 179Niklaus Manuel Deutsch (1484-1530), *Lucas Painting the Madonna*, (Detail), 1515. Panel. Bern, Kunstmuseum

fig. 180Workshop of Quinten Massys (1464/5-1530), *Lucas Painting the Madonna*, (Detail), early sixteenth century. Panel. London, National Gallery

The earliest palettes were small. Although they increased in size in the course of the sixteenth century, painters' palettes remained relatively small up to the early nineteenth century: 30 to 40 cm long. Only during the nineteenth century did they grow to the size of half a tabletop, sometimes made in such a way that they were adapted to the curve of the painter's a690body, in order to gain extra space for mixing paint (see fig. 177). This rather sudden increase in the size of the palette is quite relevant to the subject of this chapter, as will soon be evident. That large palette was the one Jozef Israëls was thinking of when he imagined Rembrandt at work.

fig. 181Aert de Gelder (16451727), *The Artist as Zeuxis, Painting an Old Woman*, 1685. Canvas, 142 x 169 cm. Frankfurt, Städelsches KunstinstitutAert de Gelder was Rembrandt's pupil around 1663. Throughout his life he continued to work in Rembrandt's late style. This painting is based on Rembrandt's somewhat mutilated painting with the same subject in Cologn (see fig. 118). Blankert has shown that both works can be interpreted as 'manifestos' against classicism. At the same time this painting provides one of the most detailed

representations of a painter from Rembrandt's school at work. The painter seems to wipe clean a brush or palette-knife on the partition of a rectangular metal container.

[h2] Palettes for the Blue Robe, a White Horse or Human Skin

When one studies the distribution of various hues on the countless palettes that appear in paintings, one inevitably receives the impression that the painters adhered strictly to a certain set of rules. This is certainly true for the period after about 1600. Prior to that time, the palette was apparently set with relative freedom. But it is precisely in those earliest representations of palettes that it is most obvious that the palettes were set up seperately for each passage to be painted. A depiction of St. Luke painting the Madonna by Niklaus Manuel Deutsch in 1515, is typical of a group of paintings completed in the fifteenth and sixteenth centuries, in which St. Luke is in the process of painting the Madonna's robe (fig. 179). The depicted palette shows a limited number of patches of paint, with various shades of blue as well as brown and a little white, apparently distributed at random over the surface of the palette. These pigments are precisely the colours needed to render the tonal gradations in the folds of the blue robe.[14] In paintings of the same period in which St. Luke is depicted while painting the naked Christ Child or the face of Mary, the palette carries a range of colours needed to mix the various flesh tints: white, yellow ochre, vermilion, red lake, various browns, black and sometimes terre verte (fig. 180).[15]

fig. 182Rembrandt, *Jeremiah Lamenting the Destruction of Jerusalem*. Detail of fig. 236 (see p. 146)

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Where the palettes with shades of blue can easily be related to the painting of the iconographically significant robe of Mary and the expensiveness of the blue pigment used for it, it seems that the somewhat more varied palettes are meant exclusively for the flesh tones, a hypothesis which will be further supported by what follows. It will then become evident that the flesh tint, just like the blue of the Madonna's robe, had an important status.

The colours for painting the human skin were not yet systematically arranged on the palette before 1600, but appear to be distributed at random. For example, the position of the white paint differs from one case to another on earlier palettes. A passage in the Brussels manuscript from 1635, by P. Le Brun, recommends placing the white in the centre of the palette.[16] Apparently the text reflects the somewhat older practice, because things started changing around 1600. From that moment onward, studio scenes and self-portraits usually depict palettes with a row of lumps of paint spaced evenly along the top edge (fig. 181).

The usual range of colours depicted runs from a somewhat larger portion of white near the thumb, to yellow ochre, vermilion, red lake, and through a series of progressively darker browns to black. Alternately, the vermilion is sometimes placed a698between the white and the thumb. This arrangement agrees with a passage in the Mayerne manuscript: *'It is to be observed, moreover, that in setting the palette, the lightest tints must always, without exception, be placed at the top and the darker tints lower down.'* [17] It is striking, and very significant in the context of this chapter, that I have found no instance of the depicted standard palettes after 1600 which includes any intense green, bright yellow, or blue paint. These are called 'the strong colours' in the Mayerne manu- script.[18] Only in David Teniers' *MonkeyStudio* (reproduced in fig. 168) is a palette with such colours found. This may be one of the satirical allusions in that painting.[19]

fig. 183Rembrandt, *David, Presenting the Head of Goliath to King Saul,* 1627. Panel, 27.5 x 39.5 cm. Basel, Kunstmuseum. Although the painting is an oil sketch, seemingly produced in one 'go', the clear separation and diversification between the different local colours (compare the different blue garments) betray a systematic working method (see p. 146)

The older boy in the dialogue in the Volpato manuscript telling his fellow apprentice that his master only need mention the part of the image about to be painted in order to get the palette composed for it, suggests the existence of fixed formulas for the depiction of the various parts of a painting. Around the same time, in 1698, a Dutchman, the painter Willem Beurs, wrote a whole book on formulas for the benefit of *'those who are learning the Noble Art of Painting'*.[20]

a704It is noteworthy that towards the end of the seventeenth century more and more details of studio practice were recorded in writing. According to another Dutch painter, Simon Eikelenberg (1663-1738), the explanation for this was that it was difficult to be apprenticed by a painter if one wanted to learn the trade late in one's years, which apparently occurred more often in his day than previously; in any case, it applied to Eikelenberg himself. [21] It is to this demand for information, usually transferred directly from master to student in the studio, that we owe texts, for instance about painting specific objects, or materials such as gold:

> *gold, not obtained from mines [in other words imitated, i.e. painted gold] is laid in with 'rusgeel' (realgar) [an orangish yellow], in the darker parts with burnt umber, sometimes with a little red lake; for the highlights one uses 'koningsgeel' [orpiment] or*

'masticot' [lead-tin yellow]; it then looks like real gold such as misers have no use for [other than looking at it] and many more worries to preserve it [fig. 182, a detail of fig. 236], [22]

or:

a white horse: one paints the illuminated side using white, light ochre and black, with pure white for the highlights; light ochre is recommended for the intermediate colour, and it is advisable to be rather sparing with white there. For the shadow, black and light ochre must be mixed together with a little white; the reflection under the belly should be mostly light ochre, with sparing use of black and white. The hooves can sometimes be painted with black, white and light ochre, with a touch of vermilion; and sometimes with black, white and umber. The colour of the nose is the same as that of the hooves. But as for the eyes: the pupil should be painted with bone black, and the rest with umber, black and white [fig. 183]. [23]

It will be clear that if an artist plans to paint a white horse, the only pigments needed on the palette are, according to Beurs, lead white, yellow ochre, vermilion, umber and bone black; and if the artist expects painting the horse to be a day's work, no other pigments need be ground and prepared for that day than those just mentioned. This fact is of essential importance to the picture being sketched here of the practice of painting: paint was generally ground and prepared when it was needed. Precisely because artists wished to keep working without unnecessary delays and therefore found it advantageous to use paint that dried quickly (thus containing different sorts of dryers), this paint could not be kept for long despite the existence of methods and implements to prevent the paint from drying too quickly, such as keeping it under water or in a little bag made of a piece of bladder.[24] If the complete range of pigments, each already ground with oil, had to be available for use at all times, large amounts of paint would have to be thrown away unused.

Willem Beurs recorded the rendering of visible nature in the manner cited above in an endless series of recipes. It is most telling that this series concludes with the colour of flesh.[25] A similar progression can be found in one of the texts which comprise the Mayerne manuscript. The author of this passage in the manuscript first provides a range of recipes for the mixing of pigments for painting landscapes and draperies, after which he finishes by writing that now he has to say something about painting nudes and faces: *'which in truth is the essence of the whole work.'* [26] This idea recurs when Beurs writes:

Just as we humans consider ourselves the a711 *foremost amongst animals; so, too, are we the foremost subject of the art of painting, and it is in painting human flesh that its highest achievements are to be seen, whenever a painter succeeds in rendering the diversity of colours and strong hues found in human flesh and particularly in the faces, adequately depicting the intricacy of the diversity of people or their different emotions.*[27]

He goes on to explain that thirteen mixtures composed of nine pigments are needed in order to paint people of different ages and genders as well as of distinct emotions.[28] The palette that Beurs gives for painting human flesh comprises mixtures of the pigments lead white, light ochre, *schijtgeel* (an organic yellow), vermilion, red lake, red ochre, terre verte, umber and 'coal black' (probably ground charcoal, which gives a bluish black). A similar palette is pictured on numerous paintings from the sixteenth to the eighteenth centuries. It

is the palette of which the French painter Pierre Le Brun explained in his manual for the visitor of the painter's studio:

> *One says: to set up a palette for the colour of flesh...; and this is the work done by the boy apprentice,*[29]

and here we meet F from the Volpato manuscript again. If one wonders why it is the flesh palette that is so often portrayed, the answer must be sought in the hierarchy of the components of the painting. Just as in the fifteenth century the blue palette represented the iconographically most significant colour for Mary (the blue of her robe), the palette for flesh colour represented the worthiest task of the painter, the human nude and the face, as expressed in the above quotations from the Mayerne manuscript and from Beurs.

fig. 184Lucas van Leyden (14941533), *Triptych with the Adoration of the Golden Calf* (Detail). Panel. Amsterdam, Rijksmuseum (see p. 148)

a716In Beurs's book this palette for human flesh is given as the second to last formula. Given the fact that the seventeenth century mind was permeated with ideas on transitoriness (*vanitas*), it is not surprising that the very last formula in Beurs's book deals with *'the colouring of a dead person'*.[30]

[h2] Technical Limitations

It will come as no surprise to anyone who has made an in-depth study of fifteenth-or sixteenth-century paintings as material objects, that every passage in those paintings was executed as a separate entity (fig. 184). The cumulative character of the painting as a whole is generally plain to see, despite the psychological compulsion acting on the viewer to perceive the painting as a unity, a *Gestalt*. Even though revolutionary artistic developments during the Baroque period brought the pursuit of pictorial unity to an unprecedented level, the sources quoted above suggest that no change had taken place in the tradition of using recipes for various components of the painting. The economic rationale for this approach has already been mentioned above. Originally, however, technical reasons may have provided an even stronger motivation for executing a painting as a series of successive passages.

For the twentieth-century painter, who normally regards paint as a pasty substance of a certain colour that can be squeezed out of a tube,[31] it is hard to imagine that to artists of not only the fifteenth and sixteenth centuries, but also of the seventeenth, the eighteenth and the first half of the nineteenth century, each pigment presented its own inherent possibilities and limitations. Some pigments could not be worked up with oil; some pigments could only be mixed safely with one or two other pigments; some pigments could only be used transparently and yet others only opaquely. Other properties, too, such as colour permanence, workability, drying qualities, and so on, could differ so strongly from one pigment to another that it was normal to use a given pigment either in pure form or mixed with a limited number of other pigments when modifying the tone and colour.[32] Herein lies the explanation for the fact that in the works of painters such as Van Eyck or Lucas van Leyden, the colours unmistakably interlock like the pieces of a jigsaw puzzle, and each passage has an individual character, especially as to transparency, surface texture, and thickness of the paint layer. The most easily workable pigments were the earth colours, which ranged from yellow ochre through red ochres to the darkest brown tints and were varied in tone by mixing them together and by adding white or blacks. Passages painted with mixtures of these pigments are subtle in their tonal values and gradations. Whenever it was necessary to achieve strong, bright colours (for red, yellow, and blue robes and the like), the passage concerned was clearly executed within carefully delineated contours in accordance with a fixed recipe, involving a specific layering or a fixed type of underpainting (see fig. 184).

It will have become clear how the additive method described here could lead to diverse forms of division of labour in the studio.[33]

fig. 185Rembrandt, *Bellona*, 1633. Canvas, 127 x 97.5 cm. New York, The Metropolitan Museum of Art

fig. 186Neutron-activation autoradiograph of Rembrandt's *Bellona* (see fig 185). Parts of the dress which contain copper – in greenish and blue-green paint – show up darker. (The mouth shows up dark also as mercury, contained in the red pigment vermilion, emits radiation at this stage of the radiographic investigation.) The contours of some of these copper containing passages (like the sleeve and the skirt) show that the green paint at first must have been laid in rather roughly before detail was added (see p. 150)

[h2] Rembrandt's Use of Limited Palettes and the Concept of 'Houding'

a725In order to jump from this traditional studio practice to Rembrandt, we need more than a few hypotheses based on fifteenth- and sixteenth-century studio practices and some seventeenth-century 'recipes'. However, there were already indications that, certainly in his early period, Rembrandt, too, must have worked in this way, when it became obvious that he completed his paintings systematically, from back to front and thus passage by passage (see p. 32-44). The implication is not necessarily that he did this using a restricted palette as described above. The fact that in the Boston *Studio Scene* (see fig. 102) two clean palettes hang above the grinding slab while the painter is holding a third one already points in that direction. Important evidence that he still followed the practice of a limited palette per passage is supplied by scientific studies. It was in fact the failure of a reconstruction project, carried out in 1981 within the framework of the neutron-activation autoradiograph project in the Metropolitan Museum in New York, which formed the seed of the study presented in this chapter. The preparation of my dummy-Rembrandt using all the procedures of Rembrandt's studio that were known at that time was a726unsuccessful because the painting was executed using a complete palette such as that of Jozef Israëls. Most of the pigments that were in use during the seventeenth century were present on the palette and they were mixed on the same mixing surface, which was cleaned at intervals. Autoradiographic investigation of the dummy revealed that the procedure used resulted in all of the pigments being present to a greater or lesser degree all over the painting. By contrast, autoradiography of Rembrandt's actual paintings resulted in surprisingly 'clean' images (figs. 185, 186).[34] In Rembrandt's paintings, certain pigments occur only within clearly demarcated zones, not in the rest of the painting. This observation has in addition been confirmed by studies of paint samples from Rembrandt's paintings, which time and again reveal that only a limited number of pigments were used in a given passage. The mixtures found usually consist of two to four different pigments; mixtures of five – or, in very exceptional cases, six – pigments are found incidentally, in particular – and understandably – in flesh passages.[35] To achieve the typically baroque tonal unity using such methods implies a highly developed level of 'management' in the use of colours and tones. It is therefore no coincidence that artists began theorizing about the nature of this 'management'. As was made clear by Paul Taylor's extremely important article on the term *houding* (in the sense of relationship), as it appears regularly in seventeenthcentury sources, a high degree of sophistication had been achieved in this matter.[36] Until some time into the sixteenth century, the picture space was still structured simply as a foreground with a background, or *campo*, the concept on which Jeroen Stumpel performed such an eye-opening study. [37] The pursuit denoted by the term *houding* was far more complex. In Goeree's formulation, *houding* is

... that which binds everything together in a drawing or painting, which makes things move to the front or back, and which causes everything from the foreground to the middle ground and thence to the background to stand in its proper place without appearing further away or closer, and without seeming lighter or darker than its distance warrants; so that everything stands out, without confusion, from the things that adjoin and surround it, and has an unambiguous position through the proper use of size and colour, and light and shadow; and so that the eye can naturally perceive the intervening space, that distance between the bodies which is left open and empty, both near and far, as though one might go there on foot, and everything stands in its proper place therein [fig. 187].[38]

When considering how intensely a painter must have been concerned with obtaining a successful *houding* while at the same time working with selective palettes as described above, it becomes clear that the level of accomplishment required was of quite a different nature to the methods of painters such as Jozef Israëls and his contemporaries, who thanks to the complete palette, could work on the entire painting at once and were free to *'dip their thickest brushes deep into the paint'* to work on the painting here or there until *'they saw that it was good'.* Seen in this light, it is significant that Sand-rart, who was otherwise somewhat sparing with his praise for Rembrandt, commented that *'on this point, the brilliant Rembrandt'* was a model of the mastery of *'what we call 'Hauding' in Dutch,'* [39] (see also Chapter XI).

fig. 187Rembrandt, *Christ in the Storm*, 1633. Canvas, 160 x 127 cm. Boston, Isabella Stewart Gardner Museum. Example of a painting in which the means by which 'houding' is accomplished are applied with great sophistication. The amount of contrast is limited

consciously. Strong contrasts are only applied where the suggestion of space requires this, for instance at the top of the rudder (dark against light) and the foam-topped wave (light against dark), while the man on the bow is again shown dark against light. In the scene with the light tones around the mast contrast is limited to some essential details; the same is true for the dark group around Christ in the stern. The figure most to the front, the sea-sick man bending over the side of the boat, wears a red garment. Red in the seventeenth century was considered to come forward in space. For that reason Rembrandt gave the man in the bow a (slightly lighter) red jacket in order to accentuate the depth of the sky behind him. Gerard de Lairesse, when discussing 'houding' advised to use the colour of one's figures clothes as a means to achieve a convincing spatial structure (i.e.'houding') in a painting

fig. 187aRembrandt, *Two old men disputing (Peter and Paul)* (detail), 1628. Panel, 72.3 x 59.5 cm. Melbourne, National Gallery of Victoria

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a736This excursion into a subject as humble as a palette, may show how research into painting techniques can shed an unexpected light on what we are used to call 'style'. Rembrandt (like his contemporaries) had to overcome many technical limitations – and the

way he did overcome them proves that style is only to a limited extent determined by technique. Rembrandt pursued his pictorial aims apparently with such determination that these limitations were indeed no more than the 'coefficient of friction' in the 'urge to form' (*Kunstwollen*) – to speak in Riegl's terminology. On the other hand, knowing the given limitations, one's eyes are opened to their visual consequences as regards the colouristic and tonal appearance of Rembrandt's paintings.a737

fig. 187bRembrandt, *Family portrait* (detail), c. 1665. Canvas, 126 x 167 cm. Braunschweig, Herzog Anton Ulrich-Museum

[h1] a740 a741VII Rembrandt's Brushwork and Illusionism; an Art-Theoretical Approach

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Ernst van de Wetering

fig. 188Rembrandt, *The Jewish Bride* (detail of fig. 173)

In the autumn of 1885 Vincent van Gogh and his friend Anton Kerssemakers visited the newly opened Rijksmuseum in Amsterdam. When they reached Rembrandt's *Jewish Bride* (fig. 188)Vincent stopped while Kerssemakers walked on. When he returned a good while later he found Van Gogh still in front of the picture. Kerssemakers later wrote that as they were about to move on Vincent said:

Would you believe it – and I honestly mean what I say – I should be happy to give ten years of my life if I could go on sitting here in front of this picture for a fortnight, with only a crust of dry bread for food? [1]

This fascination with work from Rembrandt's late period has been shared by many other people, both before and since Van Gogh. In part this is undoubtedly due to the utterly intriguing process whereby these works were created. With many artists the act of painting can easily be followed from brushstroke to brushstroke, but in Rembrandt's late work it appears to be the result of unfathomable processes. An older, Paris-based contemporary of Van Gogh's, the German Eduard Kolloff, wrote:

Very meticulous connoisseurs and amateurs of art who study everything through magnifying glasses are disconcerted by his manner of painting and find themselves at a loss: unable to discover how his pictures are made, they can do no better than declare that the hermetically a744*sealed facture of his paintings is sorcery, and that even the painter himself had no clear understanding of how it was done.*[2]

fig. 189Rembrandt, *Portrait of Gerard de Lairesse*, 1665. Canvas, 112.4 x 87.6 cm. New York, The Metropolitan Museum of Art (The Lehman Collection)

fig. 190Gerard de Lairesse (1641-1711), *Selene and Endymion* (Detail). Canvas, 177 x 118.5 cm. Amsterdam, Rijksmuseum

It seems a strange idea that a painter should not know how he created his work. It recalls the controversial remark by the Dutch Cobra-Expressionist Karel Appel, who said of his method in an interview in 1955: *'I just mess about.'* [3]

I would not quote this banal and provocative statement here if it did not irresistibly remind one of the words of the painter Gerard de Lairesse, a contemporary and personal acquaintance of Rembrandt's who, once having been his sitter (fig. 189), must have seen him at work. After maintaining that an artist should paint *'with a bold hand'*, he added the caveat: *'but not like Rembrandt or Lievens, whose colours run down the piece like dung'.* The fact that he mentions Rembrandt and his former friend Jan Lievens in the same breath will prove important, as we shall see in the second part of this chapter. De Lairesse clarified this statement by saying that an artist should work *'evenly and lushly'* (*'gelijk en mals'*), by which he meant that the brushwork should be full but uniform over the whole painting, so that *'your subjects appear rounded and raised by Art alone, and not by daubing'.*[4]

As will become clear in the course of this chapter, the term 'Art', as used by De Lairesse stands for the controlled and skilled use of elements like contour, colour, light and shadow, to

depict subjects in such a way that they are convincing in their plasticity and spatial effect, even when the brushwork is smooth (fig. 190).

A close examination of the painting a750that prompted these thoughts, *The Jewish Bride* (see figs. 188, 191-202), elucidates what De Lairesse may have meant by 'daubing'.

fig. 191Detail of fig. 188

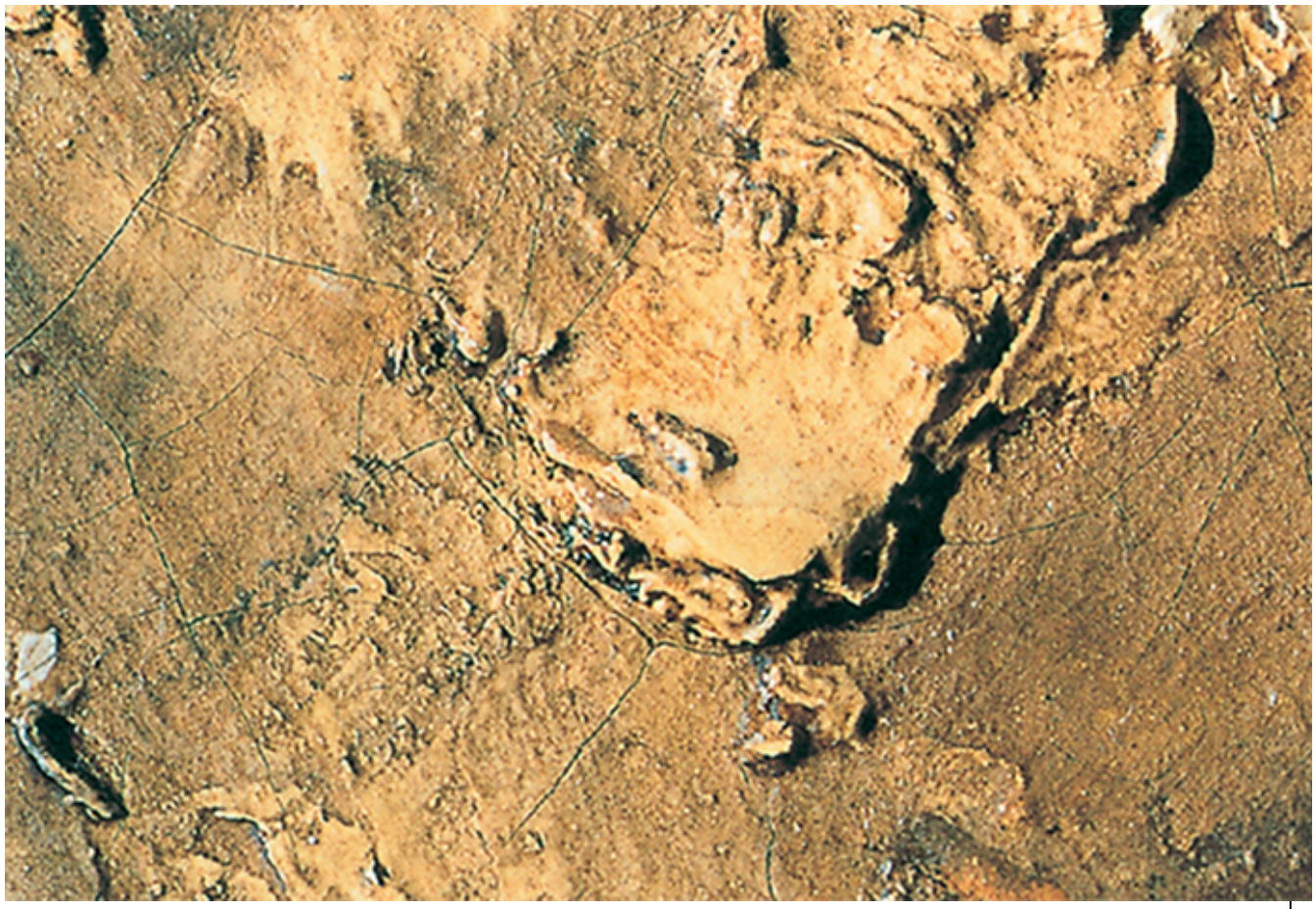


fig. 192Detail of fig. 191

fig. 193Detail of fig. 188

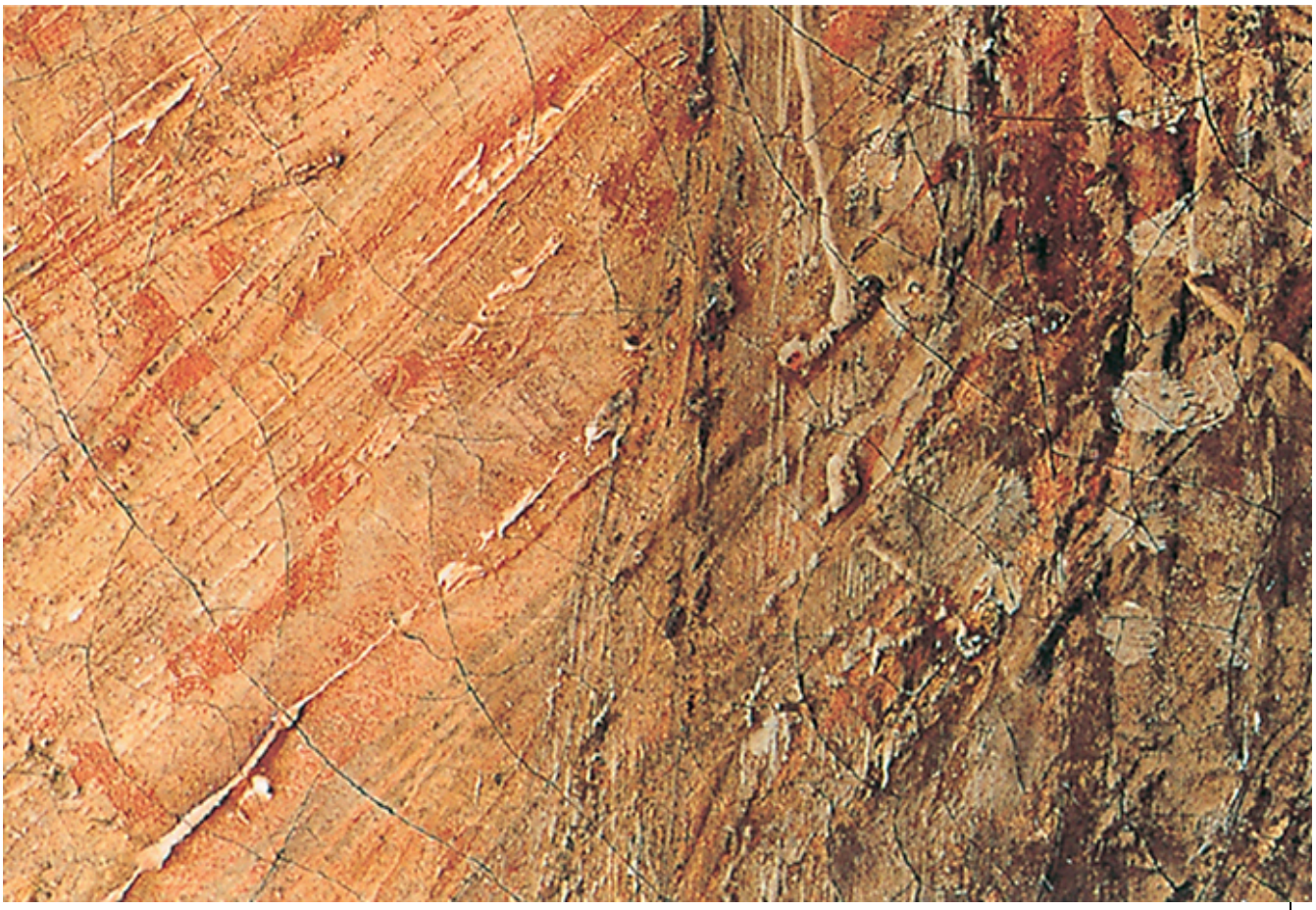


fig. 194Detail of fig. 193

Leaving aside the subject (to quote Vincent van Gogh again: *'What an intimate, what an infinitely sympathetic picture'*)[5] the first thing one notices is the unbelievably rich and varied handling of paint – a differentiation which could only have been achieved by consummate control over the paint. And yet, it almost appears to be the outcome of a geological process; in some elusive way chance seems to have played an important part in this manner of painting.

One of the most spectacular passages is the man's sleeve (figs. 191, 192), where the paint rises from the surface in clots and flakes, reflecting the light. It is a mystery how such a surface structure was achieved, and what implement was used, for it is impossible to distinguish any clear brush-strokes, nor are there any obvious traces of the use of a palette knife. The woman's shoulder (figs. 193, 194), which is covered with transparent fabrics and upon which the man's hand emerges from the shadows, is equally amazing in its execution. Lying upon a seemingly chaotically brushed-on and smudged foundation are drippings of paint which, despite the apparently haphazard way they have landed in their positions, enhance the effect that these are costly fabrics interwoven with metal thread. In the woman's red skirt (figs. 195, 196) a relief of lightcoloured lumps of paint lying beneath the surface rises up out of a sea of pink and translucent red veils of paint (in part because of abrasion of the paint surface, though).a756

fig. 195Detail of fig. 188

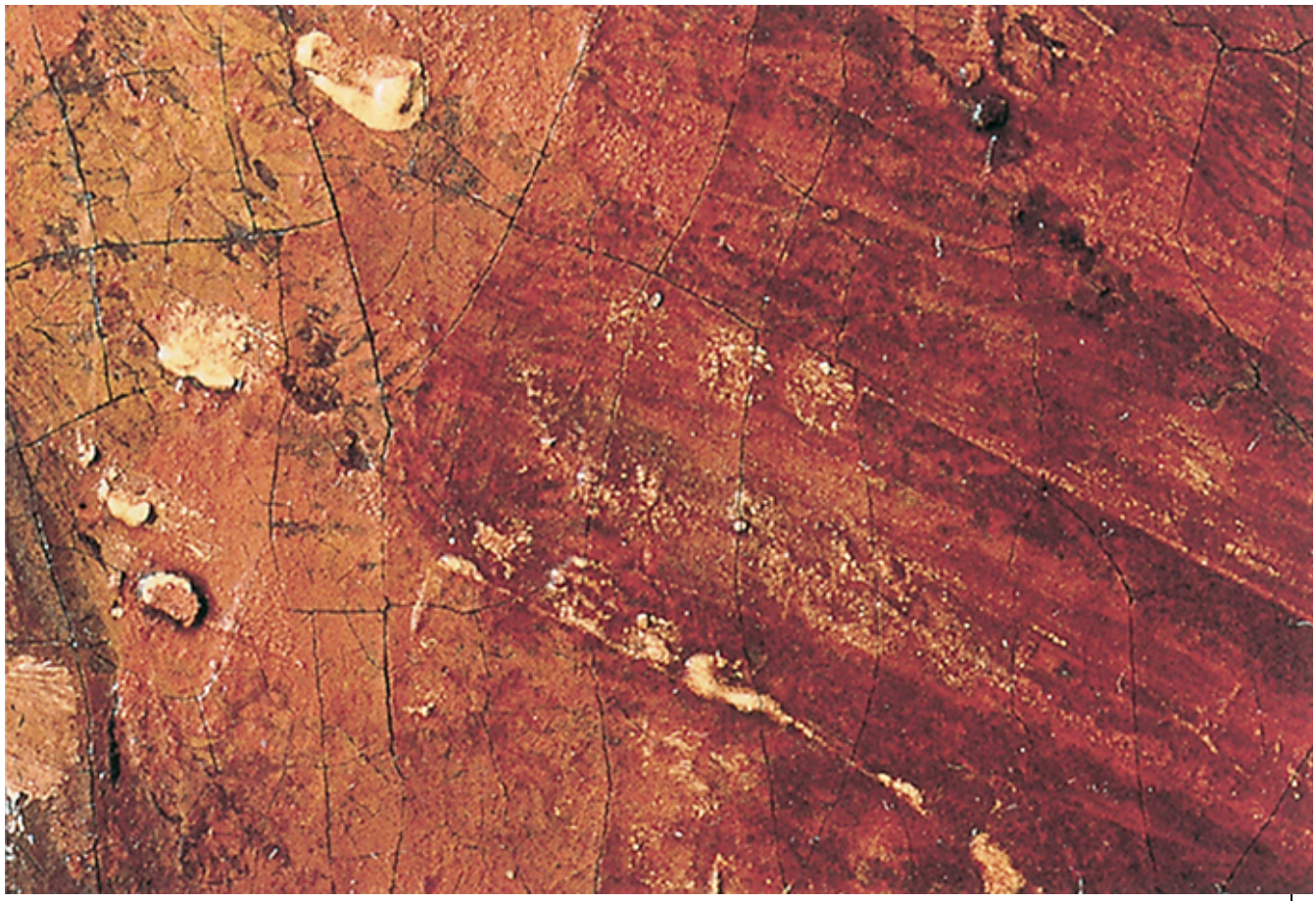


fig. 196Detail of fig. 195

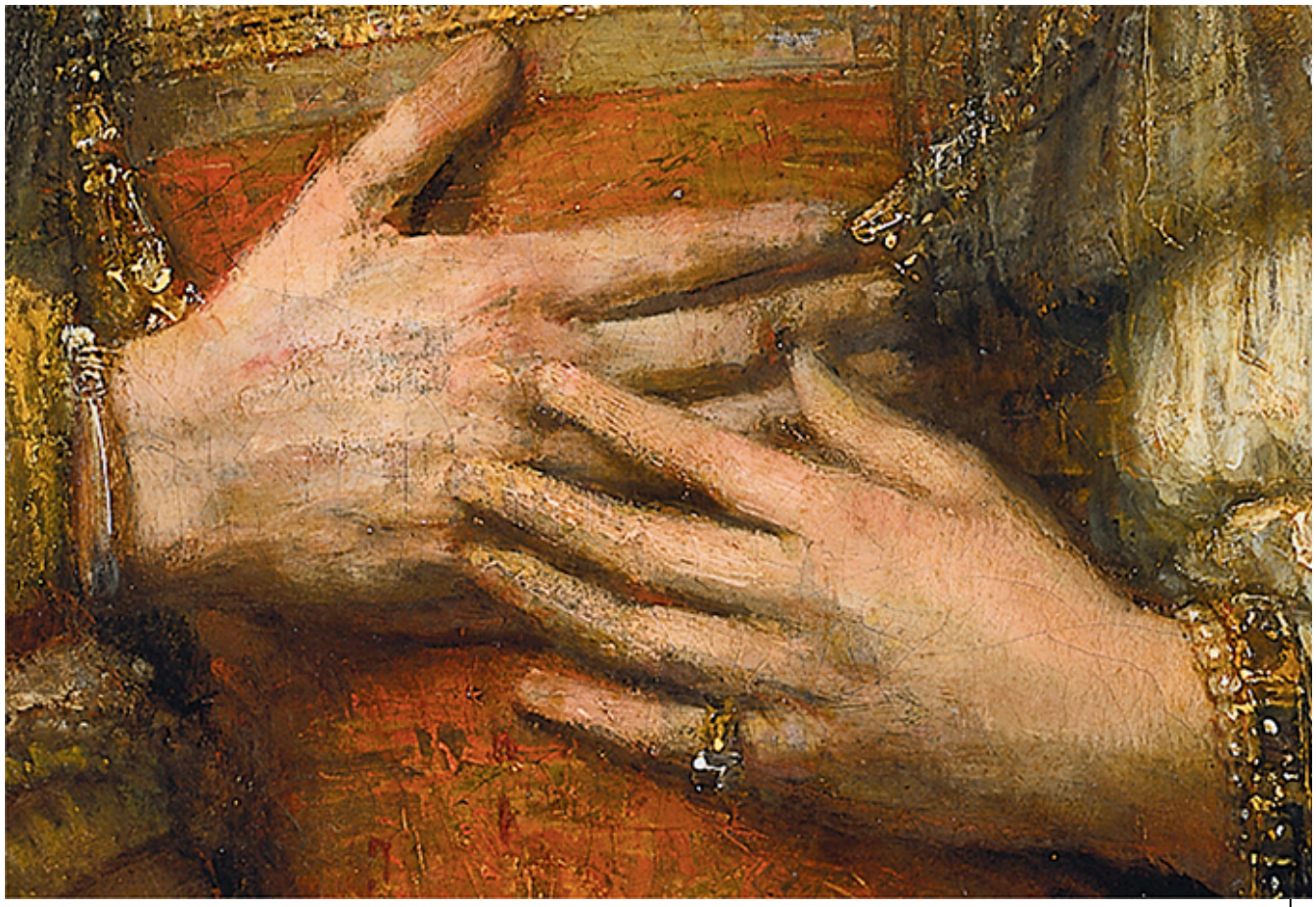


fig. 197Detail of fig. 188

fig. 198Detail of fig. 197

And what about the way Rembrandt rendered the famous tender hands on the woman's breast (figs. 197, 198)? Part of the back of the man's hand has a rough surface, giving the skin an almost tangible texture. Towards the knuckles a veil of pinkish and greyish tones rests on a smooth foundation, and over it lies the woman's finger painted with a plasticity in which the dragging hairs of the brush have drawn furrows that catch the light. Spatially, and as regards lighting, this separates the finger from its dusky foundation. The man's grey-green cloak a761(figs. 199, 200) takes its atmospheric nature from brown paint rubbed onto an uneven foundation which has a stony appearance, like ink wiped onto an etching plate after which scratches have been made in the brown paint. In such a passage the eye only searches briefly for form and structure before wandering on to less indistinct passages. The transitions from light to shadow near the woman's nose (figs. 201, 202) are not smooth, but more the result of dragging an almost dry brush over the surface.

fig. 199Detail of fig. 188

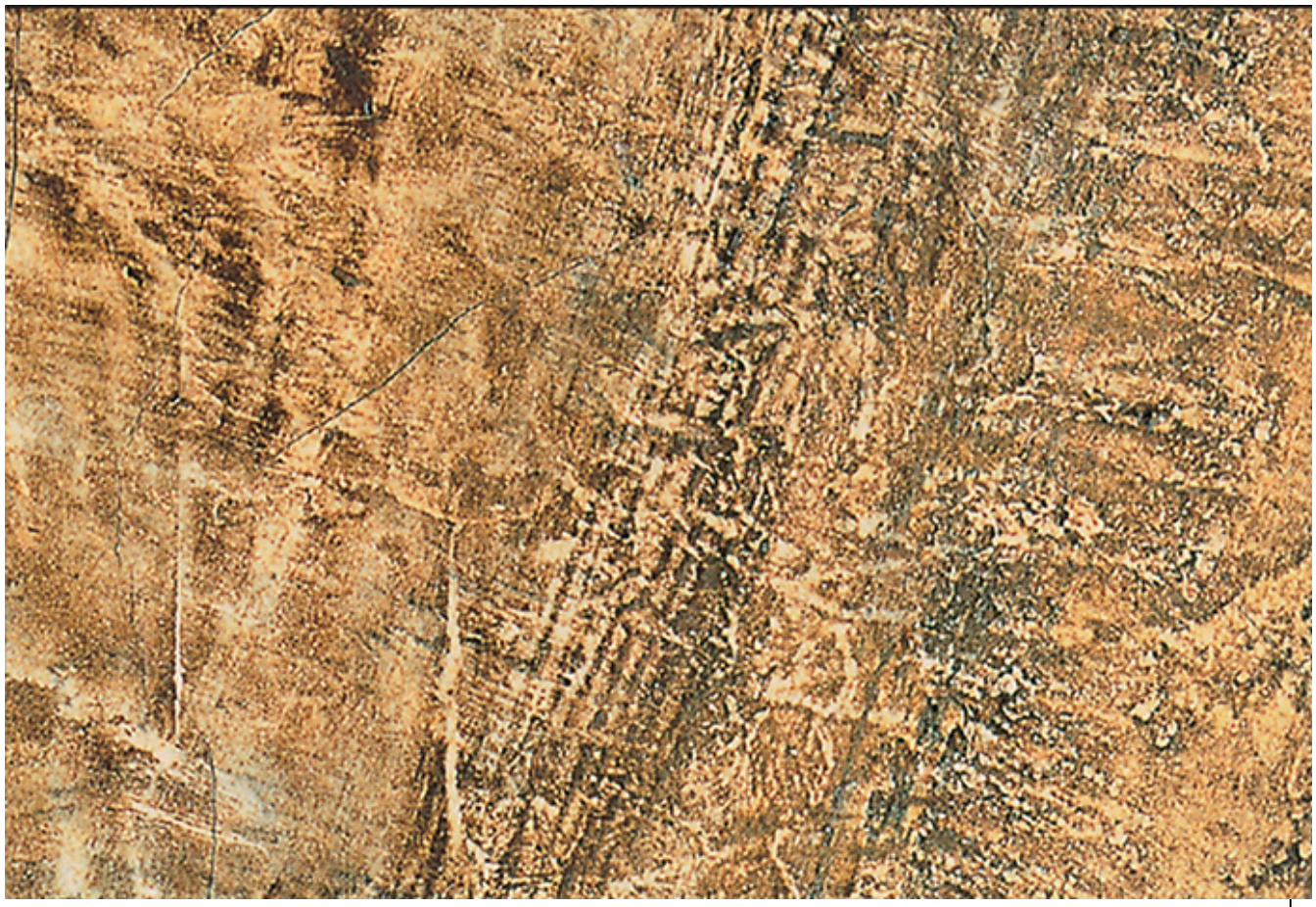


fig. 200Detail of fig. 199

fig. 201Detail of fig. 188

fig. 202Detail of fig. 201

One could continue in the same vein, exploring the many effects to be found in this picture. An attempt will be made in this chapter to uncover the roots of this manner of painting. In the process it will become clear, I hope, that the course followed by Rembrandt in his remarkable development can to a large extent be traced to ideas current in his day. By examining them in their context we may perhaps be able to 'hear Rembrandt thinking' about his way of painting.

[H2] THE VISIBLE BRUSHSTROKE

a767It is hard to believe that the painter of the *Jewish Bride* was also the founding father of the school of Leiden *Feinmaler*, the painters who, with invisible brushstrokes and *'the patience of saints and the industry of ants',* took the illusionistic depiction of objects to its furthest extremes.[6] Rembrandt began with a relatively fine technique (fig. 203) but ended up painting in the 'rough manner', as it was called in the seventeenth century (fig. 204). Until well into the present century this evolution was regarded as a highly personal development, and one that was supposedly a spontaneous process of organic growth, culminating in an *'Alterstil'*, an *'ultima maniera'* – that magical apotheosis which typifies some artists' biographies. However, there are also grounds for speculating that the process may have been guided by conscious decisions based on current ideas on 'the smooth and rough manners' which were part of the seventeenth-century workshop culture. When I discuss these opinions here and try to see to what extent they apply to Rembrandt, I do not suggest that those factors alone governed the course of his development as a painter. In the next

two sections of this chapter and the conclusion I shall undertake to show that very different concepts must also have played a part in his choices as to the 'rough' treatment of the paint.

The discussion on the smooth and rough manners has been going on for some time now, particularly in the case of Rembrandt. Jan Emmens was the first to demonstrate that the two modes were above all determined by art theory, in other words, that they involved a deliberate choice on the part of the artist.[7] A literary quotation taken at random a770serves to illustrate the feelings that the visible brushstroke evoked in the first half of the twentieth century (and still does today): *'One must see the swathes left by the brush; they are the twistings, the cries of the soul.'* [8] Such a response to the visible brushstroke was clearly prompted to a large extent by the influence to our perception by the Expressionist attitude towards works of art. A contemporary view comes from Pierre Le Brun's manuscript of 1635, a treatise containing hints to art lovers planning to visit an artist in his studio. They were advised to compliment the artist with remarks like:

> *Is it possible that the pencil can have given such softness by such rough touches, and that such apparent carelessness should be so attractive?* [9]

fig. 203Rembrandt, *Self-Portrait* with Gorget, c. 1629. Panel, 38 x 30.9 cm. Nuremberg, Germanisches National Museum

fig. 204Rembrandt, SelfPortrait. (Detail of fig. 254.)

This admiration for the fact that a convincing depiction of reality could also be achieved with a rough *peinture* shows that the paramount criterion was illusionism.

The second half of that quotation mentions the attractiveness of apparent carelessness, and it is this aspect of the rough manner that has attracted particular attention in recent art-historical discussions. It was sparked off by a remark by Eddy de Jongh about Rembrandt's *Portrait of Jan Six*, that brilliant masterpiece still in the possession of the Six family (figs. 205, 206). De Jongh referred to the concept of *sprezzatura*, which had already been the subject of some discussion in the literature on art.[10] Baldassare Castiglione had elucidated this concept in 1528 in his *Il Libro del Cortegiano* by drawing a parallel between the demeanour of the courtier and the loose, seemingly careless manner with which the artist wields his brush.

fig. 205Rembrandt, *Portrait of Jan Six*, 1654. Canvas, 112 x 102 cm. Amsterdam, Six-Foundation

fig. 206Detail of fig. 205

a778In Rembrandt's day *sprezzatura* was translated as 'looseness' (*'lossigheydt'*), and in the case of the courtier and the nobleman (or gentleman) this was interpreted, in line with Castiglione, as an effortless nonchalance of pose and behaviour. The first Dutch edition of *Il Libro del Cortegiano* appeared in 1662 and was dedicated to the same Jan Six, the Amsterdam patrician and 'gentleman-virtuoso' whose portrait Rembrandt painted in 1654 (fig. 205). Both men, Jan Six as well as Rembrandt, may already have been aware of the connotations of the concept of *sprezzatura* at that time. Not only may Jan Six's casual pose be associated with Castiglione's *sprezzatura*, but likewise, given the latter's reference to the painter's loose touch, the remarkably free manner which Rembrandt employed for this particular portrait.[11]

Yet the concept of *sprezzatura* does not provide an entirely satisfactory explanation for Rembrandt's conversion to the rough manner. 'Looseness' is not the most typical aspect of his late style. There is another sixteenth-century author who is of far greater importance for understanding Rembrandt's rough manner, and that is Vasari (1511-1574) in his *Life* of Titian (1488 or 1490-1576), which was included in the second, 1568 edition of the *Vite*,[12] and was translated almost word for word by Karel van Mander in his *Schilder-boeck* of 1604.[13] Though Titian could be classed as a *'cortegiano'*, the roots of his late, rough manner do not derive primarily from the concept of *sprezzatura*.

Although he died only some thirty years before Rembrandt was born, Titian had long been a legendary figure, not just to artists but to all cultivated Europeans.

fig. 207Raphael, *Madonna and Child with the Infant Baptist* (Detail), c. 1508. Panel. London, National Gallery

He was the painter who had consorted with princes on an almost equal footing, but what made him almost as intriguing was that his style changed so radically in the course of his long life. After beginning with a fine technique he later adopted a manner which Vasari called *'pittura di macchia',* or 'painting with splotches' (fig. 208). Vasari put this down to Titian's great age, leading Samuel van Hoogstraten to conclude that it was actually due to failing eyesight.[14] It makes more sense, though, to regard Titian's technique as a consequence of his method, described by Vasari, of painting directly, without first making preparatory drawings.[15] In this procedure, tonal and colour values take precedence over form. The revolutionary nature of this approach becomes apparent when one compares a painting by Raphael, say, with a late Titian (figs. 207, 208). Without exaggeration one can say that Titian's late style brought about a fundamental change in the course of the history of painting.

fig. 208Titian, *The Child with the Dogs* (Detail), c. 1570-76. Canvas. Rotterdam, Museum Boijmans Van Beuningen.

fig. 209Rembrandt, *Family Group* (Detail), c. 1665. Canvas, 126 x 167 cm. Braunschweig, Herzog Anton Ulrich-Museum

a787In this section I will be discussing a number of ideas which Vasari and other writers associated with Titian's 'splotchy' technique. There is not the slightest doubt that they were passed on more directly and with greater force by word of mouth in the contacts within and between workshops than through Vasari's *Vite* or Van Mander's *Schilder-boeck*. In order to appreciate how ideas circulating among the Italian studios could have reached Rembrandt, one only has to recall that his two teachers, Jacob Isaacsz. van Swanenburgh and Pieter Lastman, had worked for part of their lives in Italy.

One of the aspects which were discussed in connection with the rough manner was the fact that paintings executed in this way had to be viewed from a distance. From close up one saw only blotches, but from further off they fused into a representation of reality that could be more convincing than that found in a finely brushed work. It would seem then, that in the seventeenth century it was felt that pictures of this kind *had* to be seen from a distance. One of the very few pronouncements on art that we have straight from Rembrandt's mouth

occurs in a letter to Constantijn Huygens of 27 January 1639, which tells us that he himself considered that one of his paintings, a large canvas from his early Amsterdam period, should be hung in such a way *'that it can be viewed from a distance.'* [16] These words appear to confirm the story that Rembrandt

> *tugged people away who peered too closely at his pictures when visiting his studio, saying, 'The smell of the paint would bother you.'* [17]

Arnold Houbraken only published this anecdote in 1718, but we can assume that he had it directly from a Rembrandt pupil whom he knew, possibly his own teacher, Samuel van Hoogstraten, or his friend Aert de Gelder.[18]

Nowadays it is a matter of course to inspect roughly textured paintings at close <164/> range as well as from a distance. Max Doerner, the influential German writer on painting technique (see p. 193), repeatedly says what a 'great delight' it is to look at a Rembrandt from close up.[19]

a792The fact that Rembrandt stated so explicitly that his paintings should be seen from a distance is certainly remarkably close to Vasari's observation on Titian's late work, namely that *'they cannot be looked at from close quarters, but from a distance they appear perfect'*.[20]

The idea that one has to stand well back from certain works of art in order to do them justice is also mentioned on several occasions in classical literature, which was regarded in the seventeenth century as the source which legitimised all kinds of opinions. Horace's sentence beginning with the famous words: *'Ut pic-tura poesis'* is devoted to this very subject: *'A poem is like a picture: one strikes your fancy more, the nearer you stand; another, the farther away'*, by which he meant that some poems are perfect in their details while other poems owe their perfection to their grand scope.[21]

Another fact which must have featured prominently in the debate about Titian is that many of his late works are in a state which could only have been regarded as unfinished by the standards of contemporary painting practice (see fig. 208). The same applies to Rembrandt's later works (figs. 209-211), and here, too, there was an antique source which endorsed a positive attitude to the unfinished. It is Plinius who remarks that for various reasons the last unfinished works of famous Greek painters, found in their studios after their death, were more admired than their finished ones.[22] A story that Boschini had directly from one of Titian's last pupils, Jacopo Palma Giovane (1544-1628), undoubtedly did the rounds of the seventeenth-century Dutch workshops, namely how *'the most discerning connoisseurs'* bought unfinished pictures which Titian had stacked face to the wall with the intention of continuing to work on them later.[23] According to Houbraken, Rembrandt was deliberately non-committal about whether a picture was finished or not, and allowed no one else to decide when a painting was ready. Houbraken relates that he had seen paintings by Rembrandt

> *in which some parts were worked up in great detail, while the remainder was smeared as if by a coarse tarbrush, without consideration to the drawing.*

Moreover, Houbraken continues, now apparently quoting his informants,

> *he was not to be dissuaded from this practice, saying in justification that a work is finished when the master has achieved his intention in it.*[24]

This story is corroborated by many of the late pictures, which bear a signature indicating that Rembrandt considered them finished (see figs. 210, 211).

One of the most noteworthy statements in Vasari's *Life* of Titian, and possibly the most important one for an understanding of Rembrandt's development is the remark that behind the apparently effortless *'pittura di macchia'* (painting with splotches) lay a vast store of knowledge and experience. Vasari accordingly warned young artists not to attempt this technique, stressing (in a passage which Van Mander again translated almost a798literally)[25] that an artist should begin with a painstaking and fine technique and only adopt the rough manner later in life.[26] Surveying Rembrandt's career, it is as if he took this advice very much to heart (see figs. 203, 204).

The idea that an artist of Rembrandt's stature modelled his artistic biography, so to speak, on Titian's seems highly suspect, not to say blasphemous. The possibility of entertaining such a notion originated from the brilliant essay by Gridley McKim-Smith on the relationship between painting technique and art theory in the Spain of Velázquez.[27] Working from a series of contemporary Spanish texts she demonstrates how compellingly the example of Venetian painting, and of Titian in particular, influenced the theory and practice of art in Spain. Seventeenthcentury Spanish writings on the technical and art-theoretical aspects of art are possibly even richer in content than the Dutch ones, although both have more or less the same tenor. Since the sixteenth century, both Dutch and Spanish artists and writers had come into contact, either directly or indirectly, with antique sources and Italian art theory and workshop culture. Italy was the self-evident touchstone for every European painter and connoisseur.[28]

McKim-Smith highlights a phenomenon which may have made Titian normative for painters like Velázquez and, as it seems, for Rembrandt as well, and that is his liberal use of the *repentir*, or alteration made while painting. Nowadays we tend to regard the *repentir* as the record of a highly individual process, by which the artist revises and improves as he searches for the perfect form, as if regretting his earlier solution. The terms *repentir* and *pentimento* are in fact derived from words meaning 'repentance', and in Germany one even spoke of the *Reuezug* or 'stroke of repentance'. There are at least a few *pentimenti* in any painter's oeuvre. Titian, though, made countless modifications to his work, and evidently did so without feeling the slightest bit contrite, for traces of the rejected passages are often visible, and in many cases must have been so in his own day as well. It is odd to think that such an individual aspect of the painting process should have acquired a certain normative status. The *pentimento* is an almost inevitable side-effect of a method whereby, according to Vasari, Titian tried

> *to imitate life and nature [...] as closely as possible by variegating cool and warm tones just as one sees them in real life, [...] because he was firmly convinced that the proper and best procedure was to work with paint alone, without making any drawn studies on paper.*

This approach, as we know, was directly at variance with the equally normative Florentine and Roman view that the *disegno* was central to the art of painting. In the binary mode of thought current in the Renaissance, that is to say a system governed by polarities, the opposite of the fundamental principle of *disegno* was *colorito*, of which Titian was the first and foremost exponent. In this he was later followed by painters like Rubens in Flanders and Rembrandt in the Northern Netherlands.[29]

As discussed in Chapters II and IV, Rembrandt, too, rarely seems to have prepared his paintings with the aid of drawings. As a rule he began by working a804with paint and brush directly on the panel or canvas. Karel van Mander explains in *Den grondt der edel vry schilder-const* that one consequence of this procedure is that improvements have to be made while working, and concludes (significantly, in this context):

> *So [those] who are fertile in invention do as the bold do, improving a fault here and there.*[30]

fig. 210Rembrandt, *Woman Bathing in a Stream* (Detail), 1654. Panel, 61.8 x 47 cm. London, National Gallery

Van Mander's treatment of revision and improvement as part of the painting process is a sign that by the sixteenth century the *pentimento* had already become a theoretical

concept.[31] The fact a808that he said that only daring painters could permit themselves such licence with *pentimenti* must have encouraged an ambitious artist like Rembrandt to *improve* uninhibitedly while he was *inventing*, and even to allow traces of his revisions to remain visible, as Titian (and Velázquez) did. In a sense the *pentimento* was a manifestation of the artist's freedom and power over his own creations. This is illustrated by Houbraken's statement that Rembrandt was self-willed, and that he took his right of sole decision to such lengths that:

> *he is said to have painted over with a brown pigment a beautiful Cleopatra in order to give full effect to a single pearl.*[32]

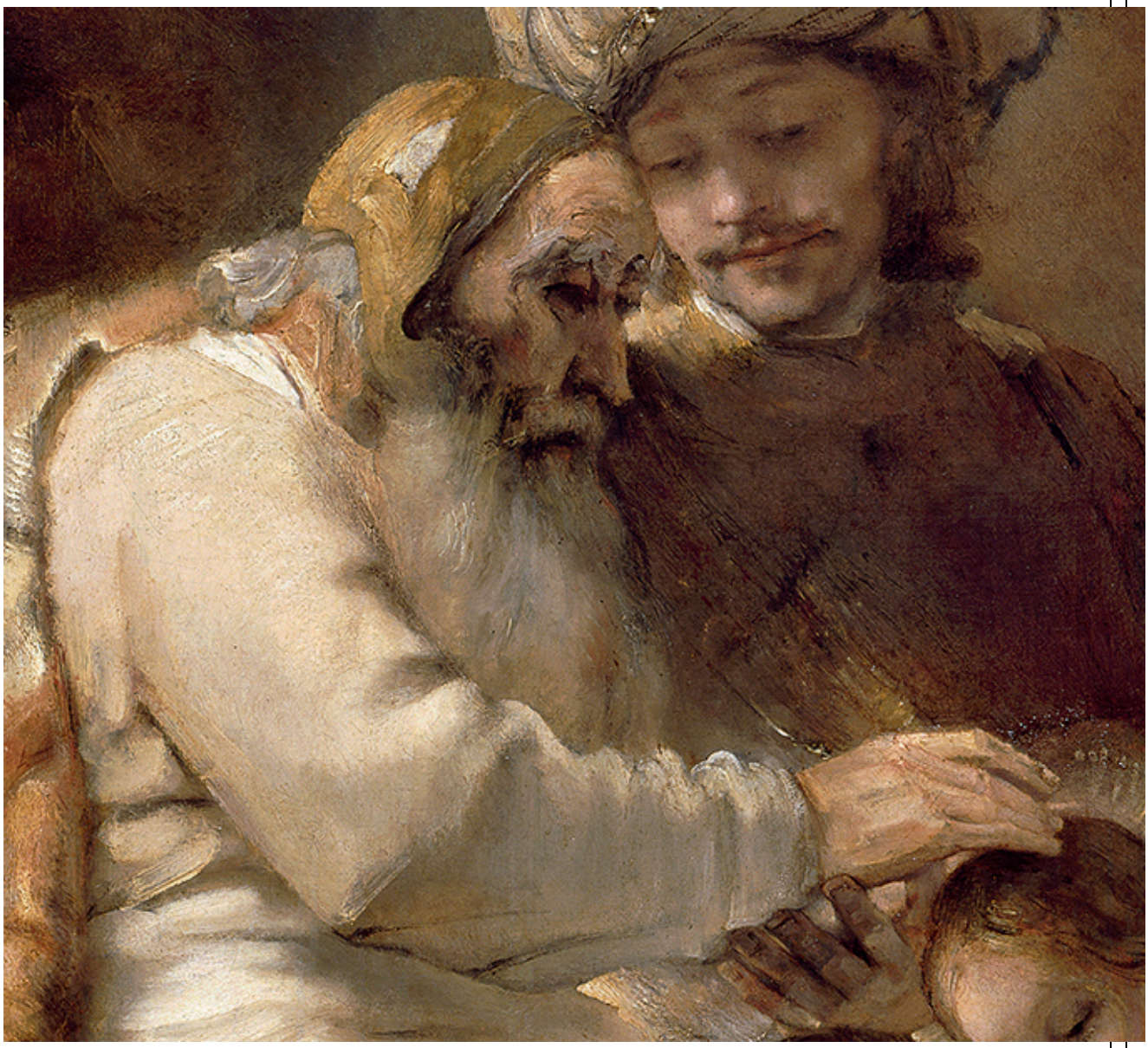


fig. 211Rembrandt, *Jacob Blessing the Sons of Joseph* (Detail), 1656. Canvas, 175 x 210.5 cm. Kassel, Gemäldegalerie

fig. 212Rembrandt, *Self-Portrait,* 1669. Canvas, 86 x 70.5 cm. London, National Gallery

a812

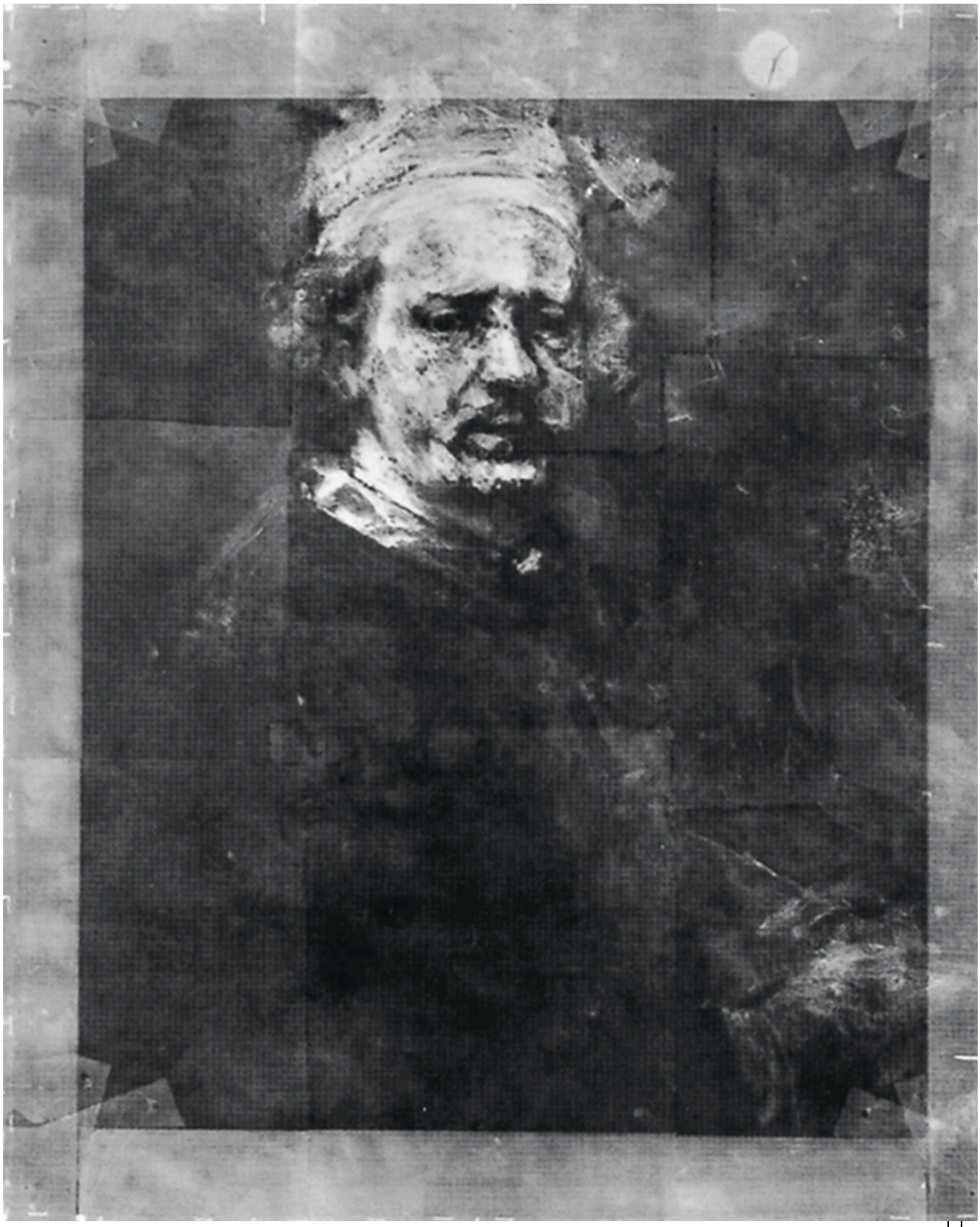


fig. 213X radiograph of fig. 212

Such an apparently exaggerated statement is borne out time and again by X-ray investigation of paintings by Rembrandt. In one of his very last self-portraits, for example,

executed in 1669 and now in London, a comparison of the picture with its radiograph (figs. 212, 213) reveals just what must have happened to Cleopatra: more and more of the elements that would catch the lights and draw the eye were painted out, toned down or altered in order to bring out the 'force' of just one part of the painting – in this case the face with the steady gaze. Once again one seems to detect an echo of *Vasari's account of Titian, who*

> *constantly returned to a picture and went over it again so often that the meticulousness became apparent: an extremely judicious, fine and astonishing manner, which makes his paintings look very lifelike, being executed with great artistry, while the effort that has been expended on them remains hidden.*[33]

Rembrandt's special interest in Titian is evidenced by the fact that in his large collection of prints after earlier masters he had a *'very large book with almost all of the works of Titian',* which undoubtedly means prints by and after the Italian master. Naturally, Rembrandt had also seen paintings by Titian and had borrowed motifs from them,[34] but as I have argued above (persuasively, I hope), it could well a816have been the Titian *legend* that had the strongest impact on him.

This was an age when people were far more open in modelling themselves on great predecessors, whom they took as their yardsticks. *Aemulatio* was the key-word. Rivalry, though, is only possible when one is armed with the same weapons, and there was the rub: how to out-shine an artist whom one considered perfect? The problem of finding a way around that dilemma must have exercised many a mind, and McKim-Smith cites an early example of a text describing one way to avoid the problem. It is a letter to Philip II of Spain in which Titian is quoted as saying that even if he succeeded in approaching the art of Michelangelo, Raphael, Correggio and Parmigianino *'I would be considered less than they, or considered their imitator',* and that he had therefore adopted a style of *'broad brushstrokes, almost like careless splotches'*.[35] Houbraken says that Rembrandt took the same way out of this dilemma, and in addition mentions the classical source on which this attitude and stratagem were modelled: the story in which Tacitus relates that Tiberius supposedly had said (cited by Houbraken),

> *that he avoided anything that would give the people cause to compare him with Augustus, whose memory, he saw, was pleasing to all.*

Houbraken concludes that Rembrandt chose his *'approach to art'* with the intention of avoiding comparison with the work of *'famous Italians and others of high repute'*.[36]

Leaving aside the question of whether Houbraken was right to apply this *topos* to Rembrandt, it is important to note the existence of this dilemma concerning *aemulatio*, and to realise that Rembrandt, too, might have needed to find a way out of it. If there is one aspect of his painted oeuvre in which he differs radically from all other painters, Titian included, it is what was described at the beginning of this chapter in connection with *The Jewish Bride* – the manner characterized by Gerard de Lairesse as 'daubing', in other words the remarkable differentiation in the handling of paint (see figs. 191-201). The background to this aspect of his technique will be examined in the following two sections.

[H2] TRADITIONAL FORMULAE AND EXPERIMENTAL DEVELOPMENTS

By definition, illusionism in painting conceals the means used to create the illusion, because a successful illusion focuses one's attention first and foremost on the objects or materials depicted and on their suggested spatial or atmospheric setting. It is only after a close and painstaking study of the paint surface that one gains an understanding of the pictorial means used to achieve this form of visual deception: the painting. To date there has been no really searching study of such pictorial elements, apart from the investigation of perspective methods. One has to agree with Gombrich, and say that the historiography of art has barely made a start on this essential question – perhaps the most important one as regards workshop practice of the period.[37]

In part this may be due to the fact that since Cézanne illusionism has been a821out of favour with both artists and critics. Today one would hear only an innocent child say that a picture looked 'absolutely real', whereas that was precisely the sort of compliment the seventeenth-century art lover was advised to pay an artist.[38] Another possible reason why the historiography of illusionism is only in its infancy is the implicit assumption that each convincing representation of reality is a newly-minted, autonomous effort by the artist, or as Gombrich puts it, perhaps art historians have *'overrated the explanatory force of a phrase such as "the meticulous observation of nature" '.*[39] Nor does the saying: *'With the patience of a saint and the industry of an ant'*, referring to the meticulous work involved in creating illusion, tell us anything about how it was actually done.

fig. 214Rembrandt, *Portrait of Haesje van Cleyburgh*, 163(4). Panel, 68.8 x 53.4. Amsterdam, Rijksmuseum

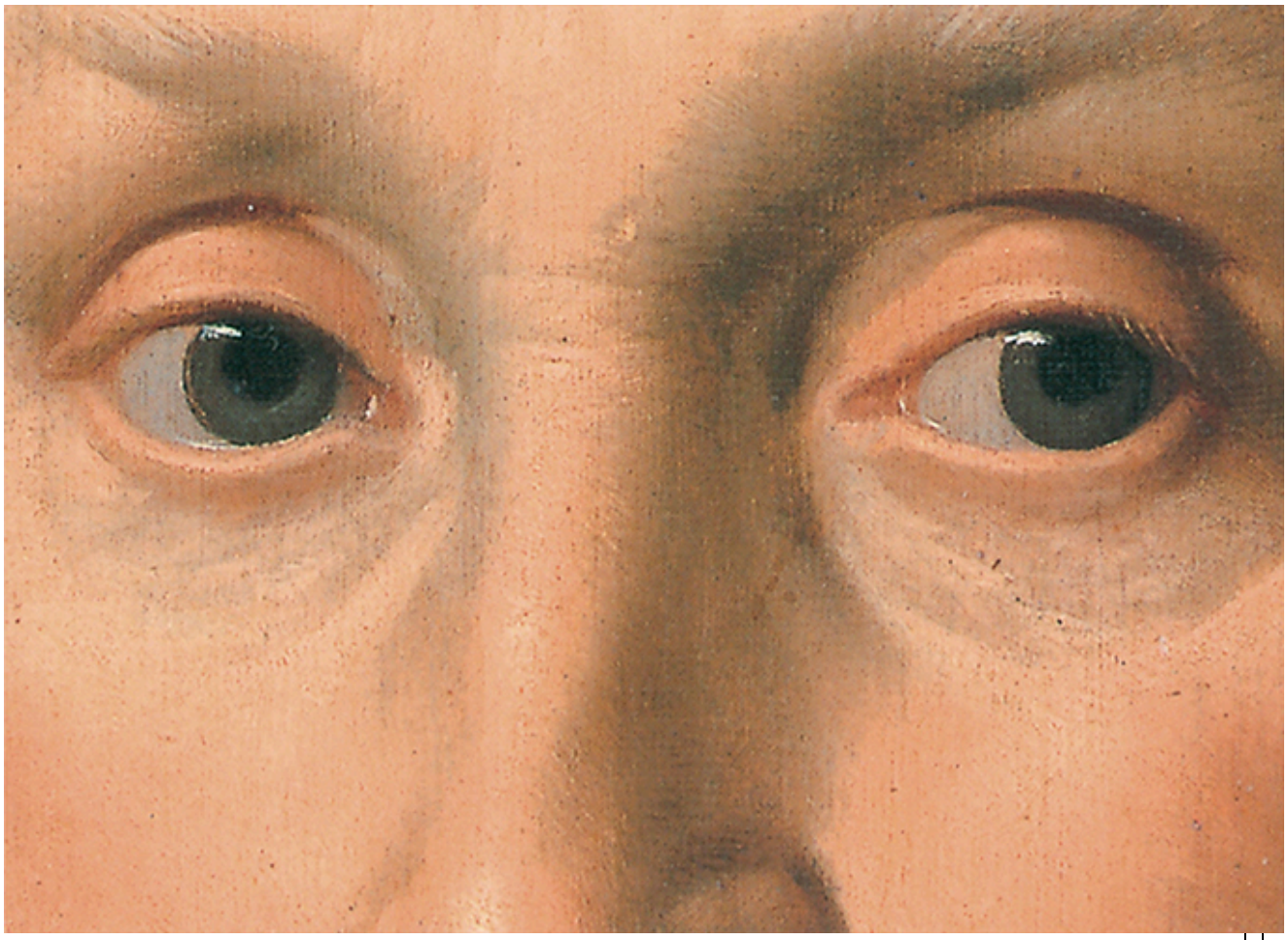
fig. 215Nicolaes Eliasz *called* Pickenoy, *Portrait of an Unknown Woman*, c. 1635. Panel, 56 x 46. Amsterdam, Rijksmuseum

In the teeming confusion of the world around us artists have had to search for hundreds of years for those particular elements that contribute most to a convincing illusion of reality. When one relates the history of that process one is in fact describing a series of discoveries that have been prised from the medium of painting and from reality itself. Gombrich has given a valuable impetus to this form of historiography, not only in his *Art and Illusion* but also in his essay 'Light, Form and Texture in Fifteenth-Century Painting'.[40]

The news of every discovery, small or large, which could lead to an even more convincing representation of reality would have spread swiftly (see also p. 139-140), with the result that this kind of innovation rapidly became part of the repertoire of painterly tricks that every artist had to have at his fingertips. That applied to every aspect of reality, including the face of a person of whom a faithful portrait had to be made. Even such an apparently unique a827task had first to be reduced to the complex of constituent elements involved in creating an illusion of reality. It was only then that the features specific to an individual could be 'projected' into this programme. *'Making comes before matching'* is the condensed formula devised by Gombrich for this process.[41]

When he painted his portraits Rembrandt also had at his disposal this stockin-trade of codified discoveries made by his predecessors, as did every other artist, in Amsterdam or anywhere else in Europe. One only begins to understand just how rich this repertoire was when a particular formula is detected in a series of comparable paintings and is then analysed as to its function in contributing to the illusion. This can be demonstrated by comparing a portrait taken at random from Rembrandt's early period (figs. 214, 216, 218, 220) with one by a contemporary (figs. 215, 217, 219, 221; attributed to Nicolaes Eliasz. Pickenoy). Comparing the two pictures detail by detail one realizes, for example, how important it must have been to discover that an illuminated form can throw reflected light onto the shaded zone of another form. In these two paintings a white ruff casts its light onto the shadowed cheek and the underside of the nose, and that reflection in turn makes the colour of the skin in the lower half of the face cooler in tone than that in the upper half. It is also clear that both artists knew that an illuminated eyelid reflects light into the dark part of the eye socket beside the root of the nose (see figs. 216, 217), and that it is not only the eyeball that has a catchlight but the fluid rimming the lower eyelid and the moist, pink inner corner of the eye as well (see figs. 218, 219). Other effects which for both artists were part of their repertoire include the appearance of a diffuse shadow cast by the eyeball, overlain by the upper eyelid with its barely discernible lashes, onto the skin beside it; the cast shadow under the nose beginning with a sharp outline and ending blurred; the use of a little red at the nostril on the side of the nose turned to the light, so as to suggest the translucency of the nostril; and light paint on the upper lip brushed in the direction of the a829light (see figs. 220, 221). Such formulae are rarely given in written sources, hence they can usually only be extrapolated from the pictures after intensive comparison.

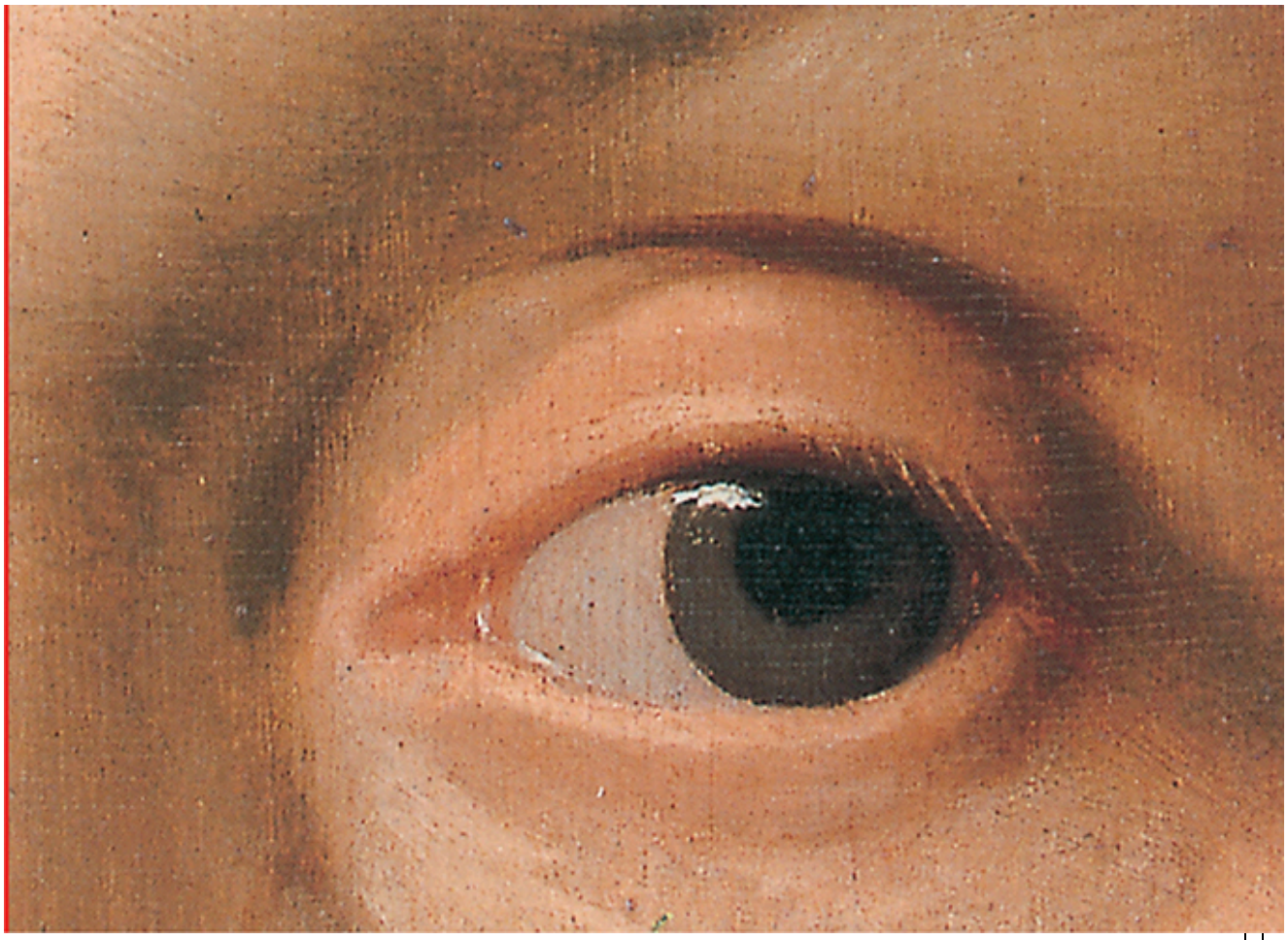
figs. 216Detail of fig. 214



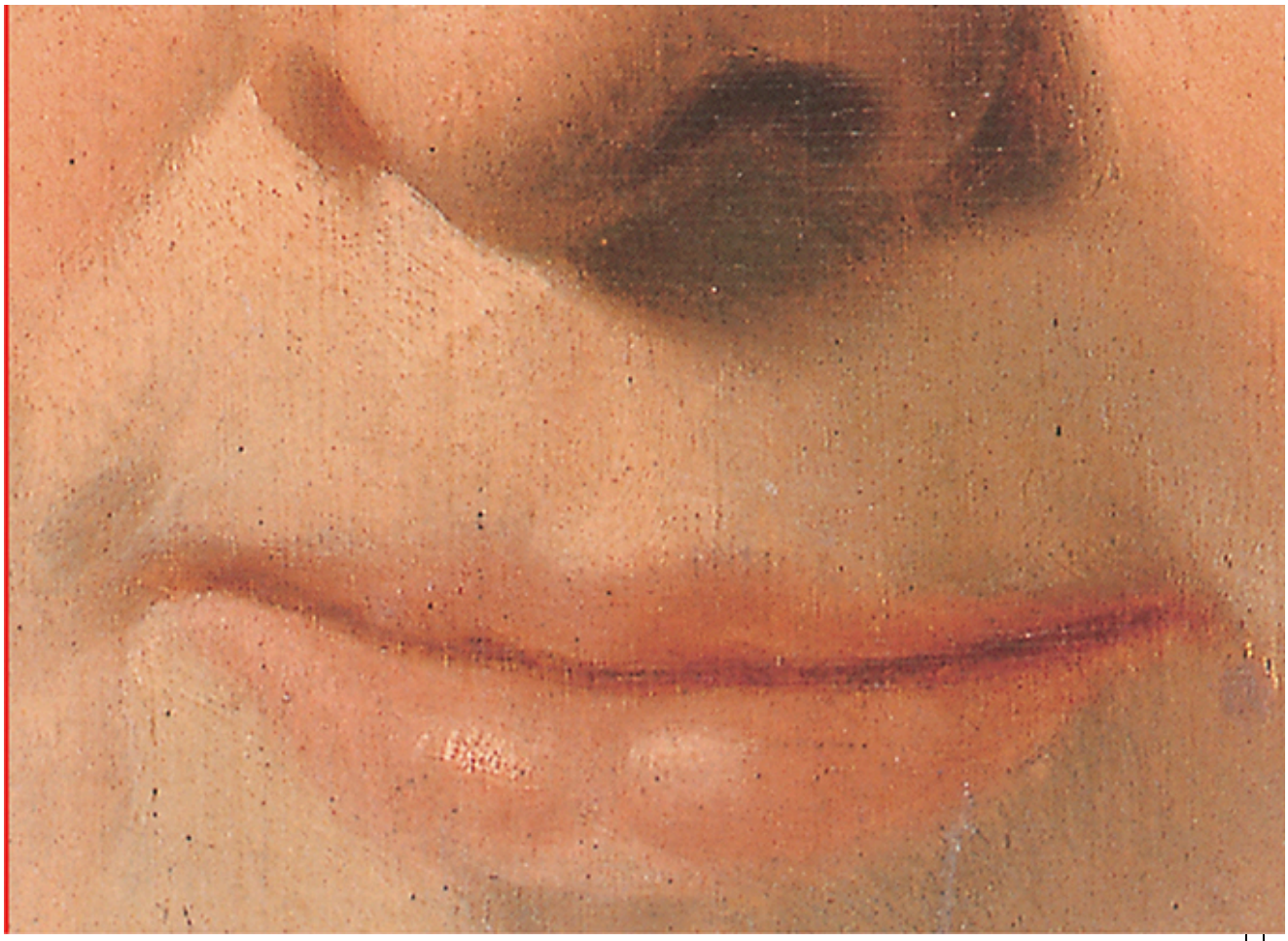
figs. 217Detail of fig. 215

figs. 218Details of fig. 214

Of course the confrontation of the two paintings illustrated here also affords an opportunity for identifying the specific features that characterize Rembrandt's style. Where Pickenoy pays close attention to each detail, modelling clearly and sharply (and at first sight far more convincingly), Rembrandt uses the brush more loosely and fleetingly, and avoids sharpness in his contours and inner drawing. One only has to look at the catchlights in the eye and the errant gleams on the slightly greasy skin under the eye and on the lower lip to see how, notwithstanding the formulaic use of illusionistic devices, the emphasis in his work is on the casualness, the almost chance nature of such effects. Alongside the monumentally moulded, frozen forms of Pickenoy, Rembrandt's figure appears to be alive. It is as if she is on the very point of changing her expression or of blinking. Conveying such a <173/> life-like image, however, could only be done on the basis of that extremely detailed programme of illusionistic tricks.



figs. 219Details of fig. 215



a834A similar body of knowledge existed for the depiction of other objects and materials. For instance, an artist had to know when painting velvet that the highest light had to be placed near the contour of the material if it was to really look like velvet, or that pewter had to be painted slightly bluer than silver, or that the reflection of a dark shape in water should not be as dark as the shape itself, and so on.[42]

In order to assess the experiments conducted by Jan Lievens and Rembrandt in this sphere in their proper context it is important to remember that in the late Middle Ages certain textural effects were achieved by imitating the structure of the surface of the material to be depicted. For brocade, for instance, a relief pressed into tinfoil (the so-called *Pressbrokat*) was glued to the picture, or to a sculpture to be polychromed subsequently. In his famous manual, the fourteenth-century Florentine artist Cennino Cennini advises anyone who wanted to suggest a woollen material to roughen up the surface of the support at that point before painting it.[43] This sort of expedient was abandoned after the major innovations in the rendering of materials which began to be introduced in the Southern Netherlands in the fifteenth century. From then on artists were expected to depict materials convincingly by means of an apt replication and gradation of colour, and of light and dark, thus suggesting light and shadow, gleam and reflection, but without modifying the consistency of the paint. This method must have been what De Lairesse called 'the Art' ('de Konst').

When one examines Rembrandt's paintings it immediately becomes clear that the surface structure has regained its importance as a means of suggesting textures. It is my belief that the young artists, Lievens and Rembrandt, experimented with these effects, and that the surface relief of Rembrandt's late works is to be comprehended not only in terms of the

'rough manner' discussed in the previous section, but that there is a connection with these early experiments in the imitation of texture as well.

A picture displaying a wealth of such surface effects is the *Musical Allegory* of 1626, in the Rijksmuseum in Amsterdam (figs. 222-224). To realize just how carefully the actual substance of the paint was manipulated to enhance textures, one only has to compare the gleaming leather of the red shoe – suggested by wiping thin, whitish paint into a transparent red which was not quite dry – with the gold brocade hem of the skirt lying over the shoe, which is executed with ridges of yellow and white paint on an impastoed yellow foundation (see fig. 223); or the silkily brushed gleam on the very smoothly painted lute with the grooved surface of the paint applied in a single stroke to indicate the individual edges of the pages of the book it is lying on (see fig. 224).

The initiative for this enrichment of the stock of devices available for textural representation may very well have come from Jan Lievens (fig. 225). In the diary kept by Constantijn Huygens, (secretary of the Dutch Stadtholder, Prince Frederik Hendrik), who met the two young painters in 1628, the 'beardless youths' emerge as two extremely ambitious adolescents convinced of their own self-importance.[44] This was particularly true of Jan Lievens, who, as we learn from his biography written by his fellow-townsman Jan Orlers, was already being feted as a prodigy at the age of twelve.[45]a839

fig. 222Rembrandt, *Musical Allegory*, 1626. Panel, 63.4 x 47.6 cm. Amsterdam, Rijksmuseum

figs. 223Details of fig. 222

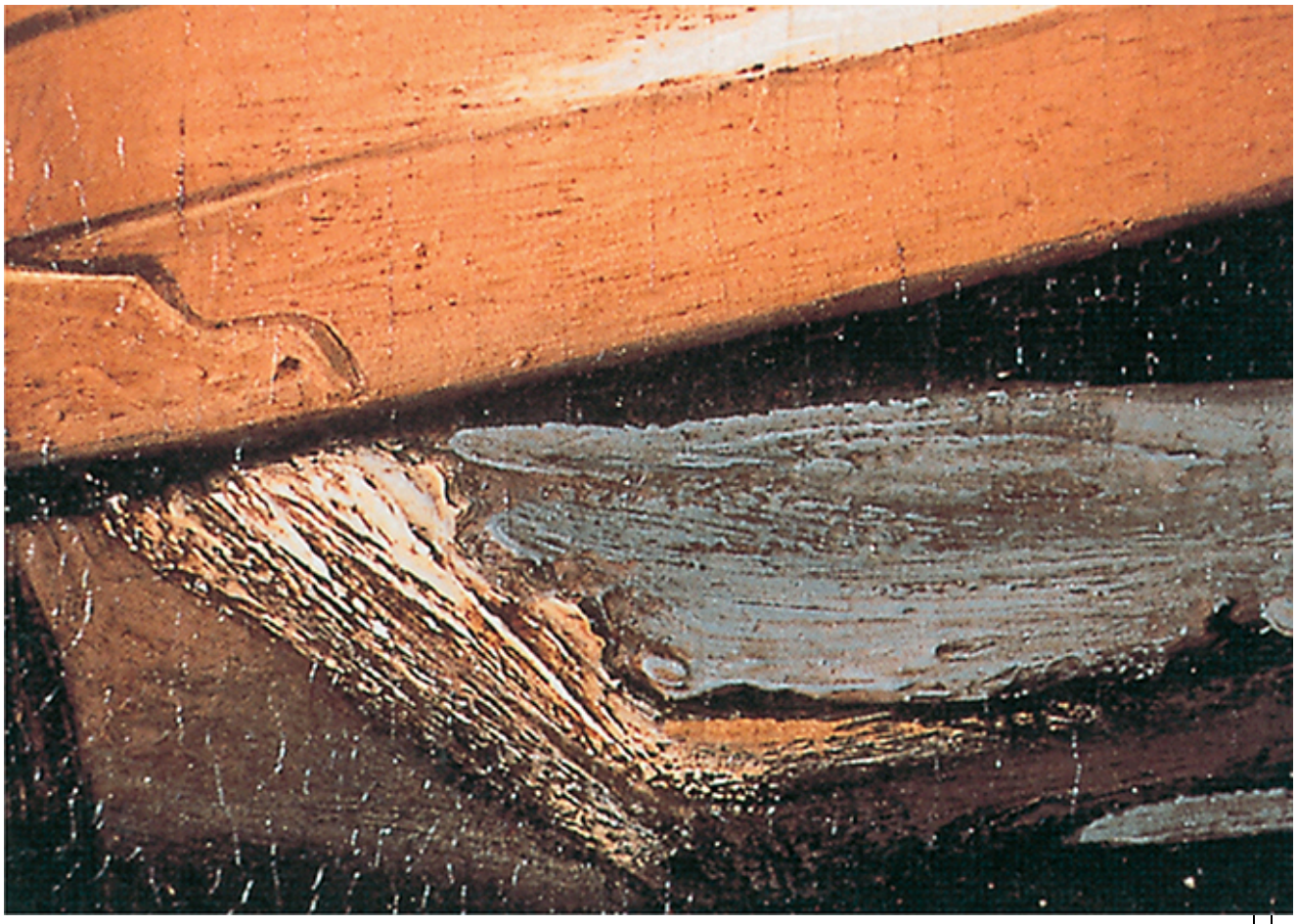


fig. 225*Jan Lievens, Esther and Ahasverus, (Detail) c. 1625* Canvas, 130 x 165 cm. Raleigh, North Carolina Museum of Art

a843It becomes clear that the two young men deliberately set out to be innovators when one compares their early work with that of their teacher, Pieter Lastman (figs. 226, 227). Despite all the stylistic similarities to his work, the most striking contrast is the degree of differentiation in the consistency of the paint used for rendering materials and lighting. Lastman applied his paint far more uniformly than did his two pupils from Leiden.

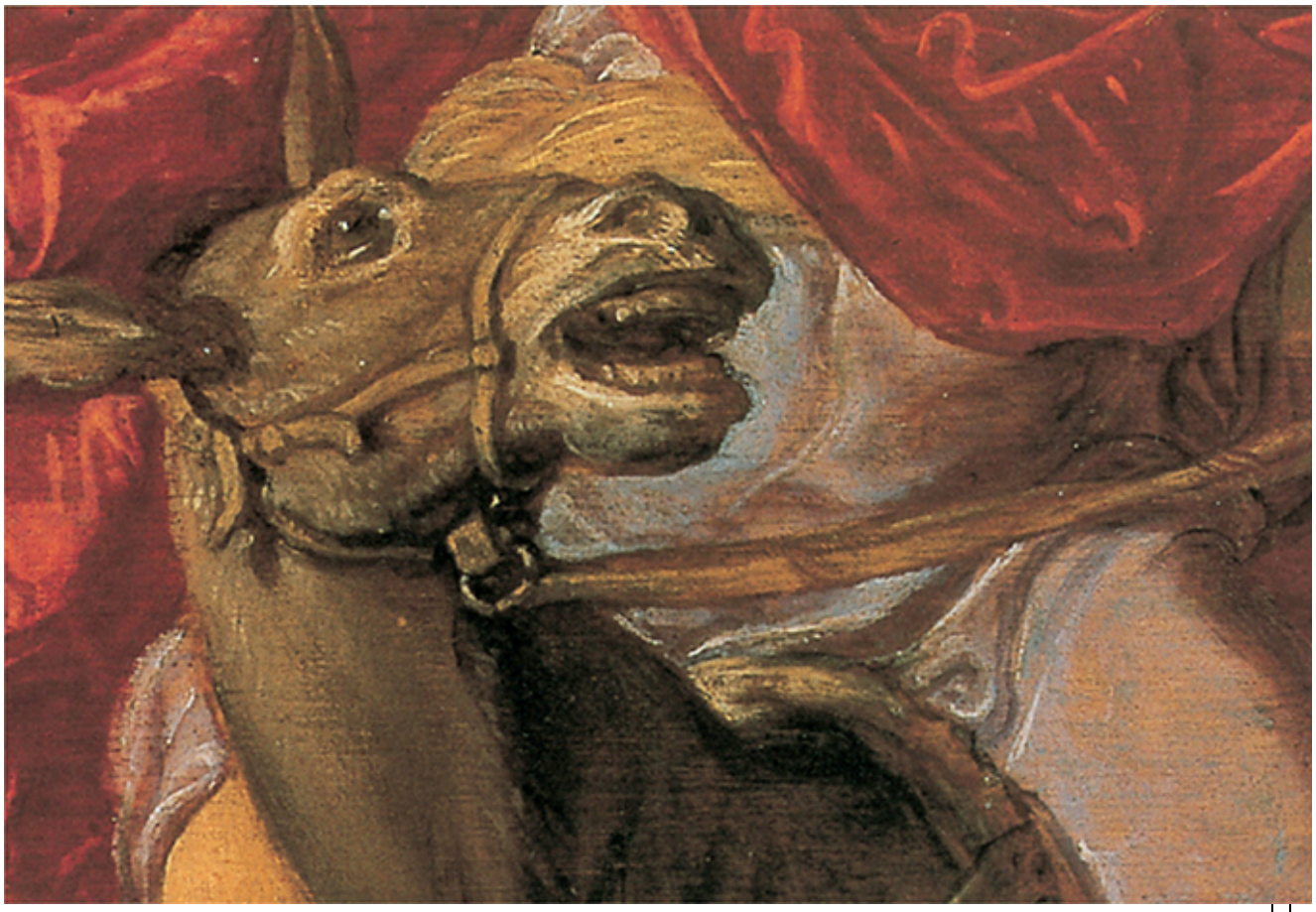


fig. 226Pieter Lastman, *Balaam and the Ass* (Detail), 1622. Panel, 41.3 x 60.3 cm. Jerusalem, Yad Vashem Historical and Art Museum

As regards reinforcing the effect of light, it must have been discovered some time earlier that this is done by applying light-coloured paint thickly and with an uneven relief. Paintings are generally hung and viewed in such a way that the paint surface does not shine, in other words, that the light striking them does not bounce back into the viewer's eyes. On the sloping 'walls' of the relief of an impasto passage, however, the paint always reflects the light to a certain extent, considerably enhancing the brilliance of that passage. This effect is found, for example, in the depiction of the glowing end of a burning torch or a lump of coal in paintings by Gerrit van Honthorst and in the flesh colour highlighted by this same source (fig. 228). Lievens had undoubtedly seen paintings of this kind, as shown by his own very early pictures of boys with torches and glowing coals, and it a845seems that both he and Rembrandt developed this idea further (fig. 229).

fig. 227Rembrandt, *Balaam and the Ass* (Detail), 1626. Panel, 63.2 x 46.5 cm. Paris, Musée Cognacq-Jay

The surmise that it was probably Lievens who took the lead in this adventurous journey of discovery can be deduced not only from the fact that he was evidently the more precocious of the two, having set up as an independent master earlier than Rembrandt, despite being a year younger, but also from a seventeenth-century source which can perhaps be read in this light. It concerns a statement in the *Inleyding tot de hooge schoole der schilderkonst* by Samuel van Hoogstraten, who could have come by this piece of information when he was a pupil in Rembrandt's studio: *'Jan Lievens was expert in seeking wonders in smeared [aengesmeerde] pigments, varnishes and oils.'* [46] It seems, then, that Lievens took a particular interest in experimenting with binding media – the drying oils and other components with which the pigment powder is ground to form a malleable paste. An interesting indication that Hoogstraten may have been recording a historical fact is provided by a studio scene drawn by Rembrandt around 1630 (fig. 230) in which the artist clearly has Lievens's features.[47] What is so remarkable about this workshop scene is the large grinding slab right beside the easel, which suggests that the artist ground his own colours while he was working. Could this be taken to mean that Lievens gave particular attention to the preparation of his paints? One gets the impression from the many seventeenth-century scenes of artist's studios that the paint was usually ground by apprentices or journeymen (see figs. 175, 287). Of course, one needs to be cautious when interpreting studio scenes, even when they are drawings, as a849literal snap-shots of reality; they are always syntheses of a number of meaningful elements. But that is precisely what makes the position of the huge, hollowed-out grinding slab beside Lievens's easel so interesting. The fact that a similar stone is given a prominent place in Rembrandt's studio scene in Boston (fig. 231), with several bottles on a table to the left of it, could also point to a special interest in the preparation of paints in the circle around Rembrandt and Lievens. This concern is further documented by Joachim Sandrart, the German artist and biographer, who emphasized that Gerard Dou, whose studio he visited around 1640 and who had been a pupil of Rembrandt for some years from 1628 onwards, ground his own colours,[48] implying that it was unusual for a master to do so. Dou's intention, according to Sandrart, was to get the purest colours possible, but Rembrandt and Lievens must have manipulated the consistency and malleability of their paint on their grinding slabs in order to give the various passages in their pictures a *peinture* and surface structure that matched the nature of the material depicted.

fig. 228Gerard van Honthorst, *The Soldier and the Girl* (Detail), 1621. Canvas, 82.6 x 66 cm. Braunschweig, Herzog Anton Ulrich Museum

fig. 229Jan Lievens, *Allegory of Fire*, Panel. Whereabouts unknown

fig. 230Rembrandt, *Jan Lievens in the Workshop*, c. 1630. Pen and brown ink. Malibu, The J.P. Getty Museum

fig. 231Rembrandt, *The Artist in his Studio* (Detail of fig 102)

It was not long, though, before they graduated from this literal approach. Around 1629, when their palettes began taking on a more monochrome cast, a855they employed the paint relief less descriptively, although it is still highly differentiated (figs. 232-235). Its main purpose now was to help 'trap' the light on the paint surface, as it were, and this, as I shall argue below, heightened the spatial and atmospheric effect. In many respects the pictures from that year recall the way the paint is applied in such late works as *The Jewish Bride* and the Braunschweig *Family Group*, for example (see figs. 188, 209). However, a comparison of details from the *Jeremiah* of 1630 (figs. 236-238) and the *Syndics* of 1662 (figs. 239-241), shows that also after 1629 Rembrandt continued to use this differentiated handling of paint to produce textural effects. The fundamental difference between this and other approaches to painting can best be illustrated by taking another detail from the *Staalmeesters* and contrasting it with a similar motif from a picture of the same period by Ferdinand Bol, a pupil of Rembrandt's who had by then completely shaken off his master's influence (figs. 242, 243).

fig. 232Rembrandt, St Paul at his Writing-Desk (Detail), 1629-30. Panel, 47.2 x 38 cm. Nuremberg, Germanisches Nationalmuseum

fig. 233Jan Lievens, *Job* (Detail), 1632. Canvas, 171.5 x 148.6 cm. Ottawa, National Gallery

Whereas even Jan Lievens, the probable instigator of this innovation by the two young Leiden artists, changed course in later years and largely abandoned paint plasticity for surface effects, Rembrandt never did. On the contrary, he used it with a versatility unparalleled in seventeenthcentury painting.

For a discussion of the possible implication of this approach to painting a858technique for the choice of binding media, see Chapter IX.

figs. 234Detail of fig. 232

figs. 235Details of fig. 233; the contour of Job's left forearm

[h2] Paint Surface and the Evocation of Space

We have not yet exhausted all possibilities for examining Rembrandt's ideas on a painting technique that produced such an unusual paint surface. A roundabout attempt had to be made in the preceding sections to reconstruct some of the concepts which might have formed the basis for this method of painting, but it turns out that there is one source, and a remarkably explicit one at that, which introduces several important new factors into the discussion. These are found in the – in this study so often quoted – book by Rembrandt's pupil Samuel van Hoogstraten, the *Inleyding tot de hooge schoole der schilderkonst*, which was published some thirty years after its author had left Rembrandt's studio (fig. 244).[49]

It is strange that seventeenth-century theories on perception have been neglected in Rembrandt research to date, despite the fact that Hoogstraten lays such emphasis on them in the passages discussed below. In fact, he even provides a key to a new way of looking at certain features of a picture like the *Night Watch* (fig. 245).a863

fig. 236Rembrandt, *Jeremiah Lamenting the Destruction of Jerusalem*, 1630. Panel, 58.3 x 46.6 cm. Amsterdam, Rijksmuseum

Hoogstraten's book has always been regarded with suspicion as a possible source of information on Rembrandt's ideas about painting, because its author was one of the pupils who in a sense 'betrayed' his master by abandoning the manner he had learned in his studio, embracing instead the smooth, idealizing style which dominated Dutch art in the latter half of the seventeenth century. To make matters worse, Hoogstraten had committed the unforgivable sin – for influential Rembrandt scholars like F. Schmidt-Degener (1881-1941) – of criticizing Rembrandt. Moreover, it had struck scholars of seventeenth-century texts that he relied heavily on previous authors, among them Karel van Mander and Franciscus Junius.[50] From the latter he borrowed the stream of references to painters and writers of classical antiquity which makes reading his book such a chore (and, at first sight, incompatible with a866Rembrandt's approach to art). Hoogstraten does, however, put forward a number of ideas on the theory and practice of painting which shed light on some of the views which Rembrandt must have held and which are not, or only fragmentarily reflected in the Rembrandt literature.

Samuel van Hoogstraten trained with Rembrandt in the early 1640s, soon after the *Night Watch* had been completed. That painting is referred to in Hoogstraten's chapter on composition, which passage since the nineteenth century has served as an important (albeit partly misunderstood) document on the contemporary reaction to Rembrandt's largest group portrait (see Chapter X).[51]

The reason why Hoogstraten's remarks on human perception as it relates to painting have been ignored in art-historical literature is probably because they incorporate ideas which hold not the slightest appeal within the conceptual framework we have constructed around the phenomenon of 'style'. The categories in which style has been viewed since the rise of stylistics mainly relate to the polarities set out by Heinrich Wölfflin (1864-1945) in his *Kunsthistorische Grundbegriffe (Principles of Art History*, 1915): the linear and the painterly, plan and recession, the closed and the open form, multiplicity and unity, and absolute and relative clarity. [52] These features, which Wölfflin discussed as abstract pictorial categories, can be appreciated without reference to any depiction of reality, which is highly significant as Wölfflin's work coincides with the rise of abstract art.[53]

There is no such stylistic vocabulary to be found in the seventeenth-century sources. To take an example which is relevant in this context, Wölfflin – when dealing with the concepts of 'plane and recession' – swiftly passes over the pictorial devices which contribute to a convincing illusion of space in favour of categories like 'planes', 'masses', 'directions', 'contrasts', 'diagonals', 'parallels', and so on. These are abstract pictorial constructs which differ fundamentally from the means of achieving spatial illusion discussed by Hoogstraten in his chapter *'On advancing, withdrawing and shortening'*.[54]

figs. 237Details of fig. 236

fig. 239Rembrandt, The Syndics *(The Sampling Officials of the Amsterdam Drapers' Guild)*, 1663. Canvas, 191.5 x 279 cm. Amsterdam, Rijksmuseum

Hoogstraten based his reflections on the notion current in his day (and indeed a873since antiquity) that light passages in a picture tend to advance towards the viewer while darker tones recede. Gombrich gives a lucid account of the discovery of this phenomenon in his essay 'The Heritage of Apelles',[55] and according to him it was probably the legendary Greek artist Apelles (second half of the fourth century B.C.) who was the first to apply it in painting, hence the title of Gombrich's essay. Hoogstraten denies the validity of this principle. The arguments he uses, and their pictorial consequences, will be dealt with later. Instead he proposes another element which he considers far more important for the effect of three-dimensionality. In discussing this element he employs the concept of 'perceptibility' (*kenlijkheyt*), which he refers to in connection with a coarse surface. He illustrates this concept by pointing out that if one goes outdoors and renders a blue sky with clouds on a piece of blue paper one never loses the impression that the paper is close to the eye, whereas the blue sky itself is infinitely distant. He explains this phenomenon by observing that

> *your piece of paper, however smooth it may appear, nevertheless has a certain perceptible roughness, into which the eye can stare, a875wheresoever you choose, which is not possible in the even blue of the heavens.*

fig. 240Detail of fig. 239

fig. 241Detail of fig. 240

fig. 242Detail of the tablecloth of *The Syndics* (see fig. 239)

fig. 243Detail of the tablecloth in Ferdinand Bol, *Six Regents and the Beadle of the Nieuwe Zijds Institute for the Outdoor Relief of the Poor*, 1657. Canvas, 143 x 192 cm. Amsterdam, Rijksmuseum

What Hoogstraten presumably means is that the somewhat coarse surface of the paper gives the eye something to focus on, making it appear substantial, perceptible, and thus close at hand, whereas the blue sky lacks this optical 'anchorage'. This information provides the key to the following statement, which is crucial for an understanding of Rembrandt's technique:

> *I therefore maintain that perceptibility [kenlijkheyt] alone makes objects appear close at hand, and conversely that smoothness a880[egaelheyt] makes them withdraw, and I therefore desire that that which is to appear in the foreground, be painted roughly and briskly, and that that which is to recede be painted the more neatly and purely the further back it lies. Neither one colour or another will make your work seem to advance or recede, but the perceptibility or imperceptibility [kenlijkheyt of onkenlijkheyt] of the parts alone.*

fig. 244Samuel van Hoog- straten, *Self-Portrait*. Etching from his book, *Inleyding tot de hooge schoole der schilderkonst* (1678)

fig. 245Rembrandt, The Night Watch (The Company of Captain Frans Banning Cocq and Lieutenant Willem van Ruyten-burch), 1642. Canvas, 363 x 437. Amsterdam, Rijksmuseum

Interestingly, Hoogstraten did not apply this proposition, which he advances with great emphasis, to his own paintings a883in the period when he wrote these words; they are smoothly executed, in both foreground and background.[56] His teacher Rembrandt, however, supplies the most consistent demonstration of this manner of suggesting space, particularly in the *Night Watch* – the picture that Hoogstraten knew so well. The emphatically rough brushwork in the foreground (not just in Ruytenburgh's dress (figs. 246-249) but also in the drum on the right and in Banning Cocq's collar and hand), and the gradual levelling of the paint towards the background, form the clearest possible illustration of this method of spatial suggestion.

fig. 246Detail of the *Night Watch* (see fig. 245)

fig. 247Detail of fig. 246

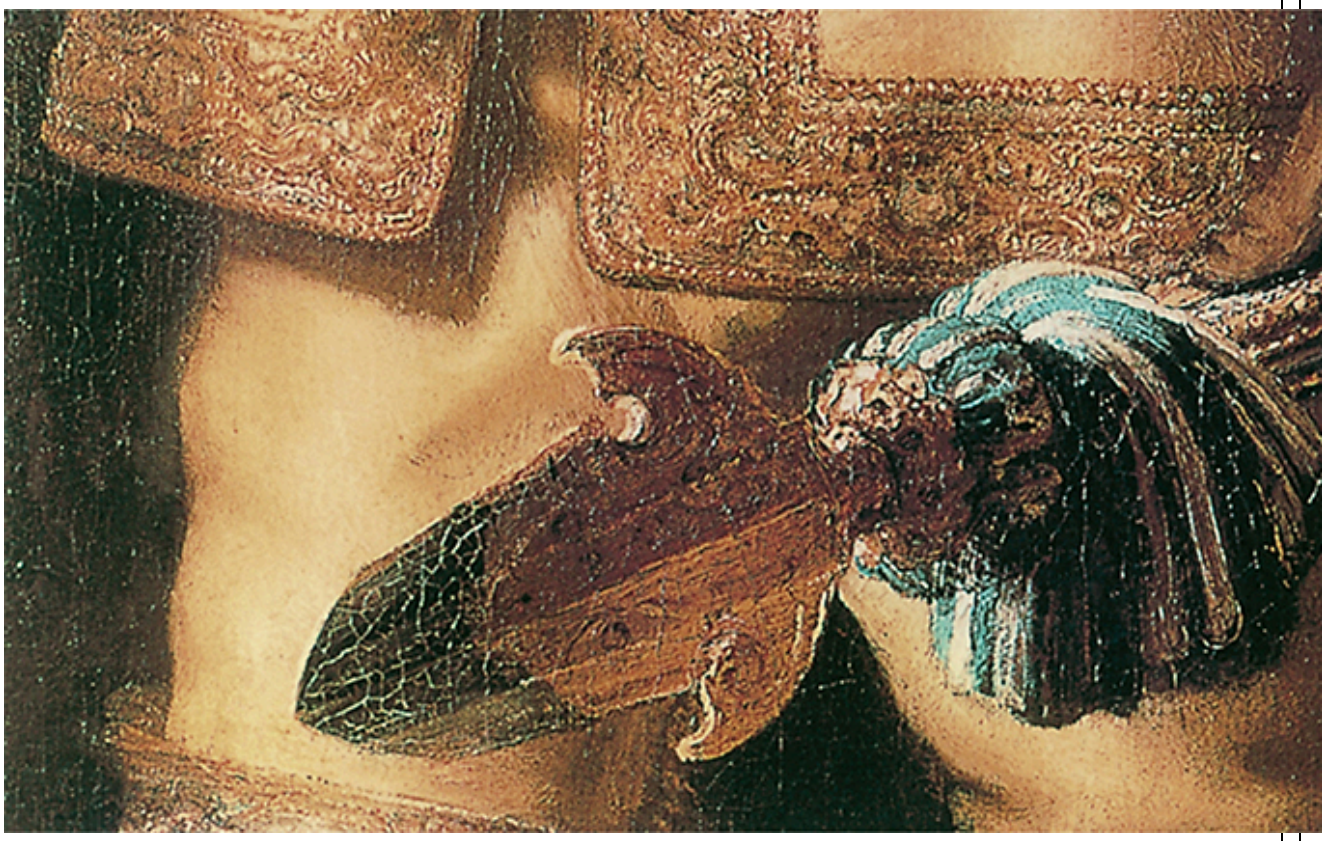


fig. 248Detail of the *The Night Watch* (see fig. 245)

fig. 249Detail of fig. 248

The reason Hoogstraten did not follow his own advice in his own later work is because by then he must have been subject to the norms of what De Lairesse called 'the Art', and in which light the use of different thicknesses of paint, 'daubing', was outmoded. It is not surprising, then, that at the very end of his discourse Hoogstraten comes up with quite another view of spatial suggestion. He notes that plasticity and spatiality ('*ronding*' and '*uitheffing*', literally: rounding and raising) have to be achieved *'by a careful observation of lights and shadows'* in pictures which are *'evenly and smoothly'* executed, and in such a way that even artists are deceived and cannot a889believe that it is mere paint *'until touch assures them that it is so'.* Illusionism, in other words (Hoogstraten, the *trompe l'oeil* painter, calls it 'deception' [*bedrog*]), in which the consistency of the paint must be absolutely smooth with the precise representation of lights and shadows alone serving to create the illusion of three-dimensionality. And this brings us back to the broad waters of illusionism using the 'even' brushstroke that began with the revolution of Jan van Eyck.

At this point we should return to Hoogstraten's reflections on the 'heritage of Apelles'. Here too, we shall see that his ideas are most clearly demonstrated in Rembrandt's paintings, and in the *Night Watch* in particular. Once again his apprenticeship with Rembrandt seems to have left its traces in his treatise. He calls it a *'blindness [which] has been profound to this day'* that painters worked on the principle that light passages advance and dark ones recede. He begins by describing what sounds like an experiment in perception theory, namely the effect produced by adjoining bands of black and white paint on a flat panel. Although they lie in the same plane, Hoogstraten writes, *'the white will nevertheless appear closer and the black further off'.* It is for this reason that *'the deep hollow of [...] a*

pit [...] or a channel' should be painted with dark colours. Quoting from Franciscus Junius's *De pictura veterum*, which appeared in a Dutch translation in 1641 (one year before Rembrandt finished the *Night Watch*), he continues that *'a girl's breasts or an outstretched hand'* are usually given *'a distinct shadow'* on either side in order to make them stand out.

Having said this, Hoogstraten then puts forward arguments from which it emerges that the opposite is also possible. He argues that the sun, although bright, is not experienced as being near at hand, and points out that a hollow looks even deeper when it *'receives some light in its actual depth'.* He goes on to maintain that darker forms can also advance by referring to the phenomenon, noted in classical times by Philostratus,[57] that dark fish which are closer to the surface of a transparent body of water appear darker than those swimming nearer the bottom. No matter how far-fetched the arguments may appear at first sight, they represented a direct challenge to traditional ideas on pictorial three-dimensionality. Hoogstraten naturally grants that many artists inserted *'heavily-shaded figures in the foremost corners'* of their paintings, *'flooding the middle-ground with a light'.* The sense of space conjured up by a dark repoussoir, generally in the form of a shadowed coulisse (*'in the foremost corners'*), had been discovered back in the sixteenth century, but it is as if Hoogstraten wants to go further in contesting traditional thinking on the behaviour of light and shadowed passages in painting. It is not just the shaded repoussoir that is an exception to this rule.

If one looks at the *Night Watch* in this light (see fig. 245), it does indeed appear to be a practical demonstration of Hoogstraten's theories, and such a literal one as to prompt the thought that it was Rembrandt himself who challenged the correctness of the 'heritage of Apelles', and that Hoogstraten is merely echoing his master's ideas. Because the fully a891illuminated Banning Cocq wears a jet-black costume and is a dark element in the composition, yet he does not 'yield ground' to the radiant figure of Ruytenburgh. The equally luminous yellow girl, on the other hand, does 'withdraw' into the hollow between the *schutters*, the guardsmen. Banning Cocq's outstretched hand is not flanked by darker tones, but on the contrary by his brightly lit, white cuff. Likewise, the dark tip of Ruytenburgh's partisan (the halberd-like weapon in his left hand), which is in a fully illuminated zone and was felt by Rembrandt's contemporaries to be startlingly three-dimensional, is surrounded by the much lighter tone of Ruytenburgh's trousers (see fig. 248).

Hoogstraten makes another important observation on the rendering of depth which he discusses in considerable detail, and in a sense it combines the two previous ideas. It concerns what Hoogstraten calls *'the thickness of the air' ('de dikte der lucht')*, namely the presence of air between the viewer's eyes and the objects beheld, which affects their appearance. It had long been known that a landscape takes on an increasingly lighter, more bluish hue the further it recedes into the distance. This phenomenon, known as aerial perspective, was a firmly established artistic tenet by the fifteenth century. Leonardo's well-known *sfumato*, or slight blurring of contours, was associated with this realization that air has a mellowing effect comparable to that of vapour or smoke (*fumo* in Italian, hence *sfumato*).

In speaking of the 'thickness of air', Hoogstraten dwells at length on the fact that more distant shadows are lighter in tone than those nearby (one recalls the example of the fish near the surface and the ones further down, which initially seemed rather far-fetched). One's attention having been drawn to this phenomenon one realizes that Rembrandt used it as a way of enhancing the suggestion of distance between, say, the yellow Ruytenburgh and the girl in the yellow dress in the *Night Watch*; the shadows in the girl are definitely lighter (see fig. 245). Of particular interest though, is Hoogstraten's remark that

it appears that the air forms a body even over a short distance, and clothes itself in the colour of the heavens.

In other words, aerial perspective produces tonal differences even when the viewer is close to an object, separated only by shallow layers of air-filled space. The young Rembrandt had already applied this insight with great subtlety in his depiction of the group of surgeons in the *Anatomy Lesson of Dr Nicolaes Tulp* (figs. 250, 251). It is only when one consciously takes notice of these extremely refined modulations of light and tone from one head and collar to the other, from front to back, that it becomes clear that this is one of the main reasons for the strikingly atmospheric effect of Rembrandt's paintings. One spectacular instance of his deployment of the fact that air also *'forms a body'* over a short distance is the tassel on Ruytenburgh's partisan, for he starts using a lighter blue beyond the point where the blue-and-white fringe of cords is bound together (see figs. 245, 248, 249). Clearly noticeable, too, is the fact that over this distance of a few centimetres the paint surface has already started to become smoother. So this passage in the *Night Watch*, a892which according to Baldinucci struck the citizens of Amsterdam with the utmost amazement and admiration, brings together three of the aspects of spatial representation discussed above: the use of a variable roughness of the paint surface, aerial perspective operating over a short distance (see also fig. 253), and the possibility of darker passages advancing further than lighter ones.

fig. 250Rembrandt, *The Anatomy Lesson of Dr Nicolaes Tulp*, 1632. Canvas 169.5 x 216.5. The Hague, Mauritshuis

fig. 251Detail of fig. 250

One other aspect to the representation of space is associated with the previous ones. It concerns the handling of contours, which are conspicuously coarse in Rembrandt's later work. As regards the blurring of contours, he must have been faced with something of a dilemma. With Leonardo's *sfumato* method the paint could be 'merged' due to its relatively slow drying time, in other words, it could be blended wet-in-wet with the adjacent passage. De Lairesse speaks in this connection of *'a suitable and moist ground behind the figures, such that the outermost contour can disappear into it'* (see fig. 190).[58] However, this would imply that the paint becomes smooth at that point, that it takes on the *'evenness'* which, as

Hoogstraten may have heard from Rembrandt's own lips, *'makes objects recede'.* It was for this reason that Rembrandt evolved that peculiar, rough *sfumato* which is effected by dragging a brush loaded with stiff paint over the surface to produce a rough ('perceptible') but still evocative contour or tonal transition which plays an essential part in the spatial and atmospheric effect of the painting (figs. 252, 253; see also figs. 201, 202).

This latter device, and much of what has been adduced in the previous two a896sections to explain Rembrandt's handling of paint, has a distinct overtone of 'effect' or 'trick' to our twentieth-century sensibilities. That impression would be correct if Rembrandt had used these methods calculatedly as a painter's sleight-of-hand. However, his work is also characterised by that 'boldness' mentioned at the beginning, that attitude which Vasari calls *'spirit and a charming and vivacious style'* when he quotes Michelangelo on Titian.[59] A place had been allotted to artists of this kind in the theory of art current throughout Europe in the seventeenth century, as is clear from the words of Gianlorenzo Bernini (1598-1680), the most famous architect and sculptor of his day. During his stay in Paris in 1665 (at approximately the time when Rembrandt must have been working on the *Jewish Bride*), his conversations were noted down by his French host, Paul Fréart de Chantelou. Speaking of the Venetian followers of Titian – Tintoretto and Veronese – Bernini said that they

> *and some other modern artists have succumbed to a free or wild manner of painting.* [60]

Rembrandt can certainly be classed in this category, but as I trust I have shown above, freedom or wildness do not automatically mean *'messing about'* so that *'the colours run down the piece like dung'.*

The object of this chapter has been to penetrate the terminology and thinking of the seventeenth-century painter in an attempt to shed light on some of Rembrandt's theoretical concepts. It will have become apparent that it is very difficult to distinguish between new ideas attributable to Rembrandt himself and ideas for which the ground had been prepared, partly or wholly, in earlier times, often as far back as classical antiquity. What is needed is a genealogy of all these ideas which would enable us to trace them all back to their roots – or ascribe them to Rembrandt himself.

fig. 252Detail of *The Syndics* (see fig. 239)

fig. 253Detail of fig. 252

fig. 253aRembrandt, *Head of a man*, c. 1661 (Oil sketch for the Washington Circumcision). Panel, 24.8 x 19.1 cm. Milwaukee, Coll. Alfred and Isabel Bader

a902

When at the beginning of this chapter, I likened the surface appearance of the *Jewish Bride* to the result of a geological process, I did so in an almost helpless attempt to record

my impression of a structure which, however well planned, could only have been achieved with a strong element of chance. As already indicated on page 89, a passage in the twelfth *Discourse* delivered by Sir Joshua a903Reynolds on 10 December 1784, may perhaps shed a surprising light on this aspect of Rembrandt's manner. It is of a far too advanced date to be directly applicable to this investigation, but it is a text with much older roots, as is so often the case with Reynolds. Here he deals with the role of chance in painting (and Byin direct connection with Rembrandt, at that), and ends with the words:

> *Work produced in an accidental manner, will have the same free, unrestrained air as the works of nature, whose particular combinations seem to depend upon accident.*[61]

The reader may remember that the aspect of chance in the conception of a painting was touched upon in Chapter IV. Perhaps here we have a last theoretical means of access to the specific nature of Rembrandt's late manner.

Rembrandt's 'daubing', his richly differentiated use of paint, has been approached from three different angles in this chapter. The first was in the context of the debate on the 'rough and smooth manners', which must have been a considerable topic of discussion in seventeenth-century workshops. Factors which played a role here were viewing distance, degree of finish, apparent casualness, and the use of the *pentimento* as a side-effect of 'painterly painting'. Such notions can be associated with a blotchy or rough manner of painting, which was introduced by the immensely influential Titian. However, they fail to provide a satisfactory explanation for Rembrandt's use of surface relief and for the differentiation in the consistency of his paint. It turned out that there were two avenues for deducing the reasoning behind this aspect of his method: the young Rembrandt and Jan Lievens abandoned the method of rendering textures which they had learned from their teacher, Pieter Lastman, and in effect went back to medieval procedures, manipulating the surface of the picture to produce a mimetic representation of the materials depicted. In Rembrandt's oeuvre one finds this approach persisting right up until the end of his career. In addition, though, the rough paint structure, based on seventeenth-century perception-theoretical arguments, also played an important part in creating spatial effects, and this, too, accounts for the rough contour – Rembrandt's own variant of Leonardo's *sfumato*.

The phenomena discussed here have always been seen as highly individual aspects of Rembrandt's art, the fruits of his own artistic temperament and 'evolution', to use that thoroughly anachronistic term for once. The discovery of the underlying concepts, as presented in this chapter, may be somewhat sobering. By connecting Rembrandt's manner with certain seventeenth-century ideas, however, at most our point of view has shifted and may have been brought more into line with Rembrandt's own artistic intentions.

[h1] VIII Rembrandt's Method of Working in the 'Night Watch' and his Late Paintings

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fig. 254Rembrandt, *Self-Portrait*, c. 1665 (Detail). Canvas, 114.3 x 94 cm. London, Iveagh Bequest.

a907

a908Having discussed the art-theoretical rationale behind Rembrandt's late rough manner in the previous chapter, we ought to ask whether Rembrandt's method of working – the succession of steps itself – as assessed in Chapter II for the early Rembrandt, changed in the course of his development. Is it conceivable that he could have achieved those effects so characteristic of his later work using procedures and techniques that were essentially unchanged, or did his approach to the process of painting alter over the years?

[h2] Doerner's 'Glazing Myth'

In this century, the views on the older Rembrandt's painting technique have to a large extent been determined by the ideas of Max Doerner, whose Malmaterial und seine Verwendung im Bilde, first published in 1922, is one of the most influential books ever written about technical matters in painting. It was translated in English in 1934 under the title: *The Materials of the Artist* and *their Use in Painting, with Notes on the Techniques of the Old Masters.*[1] Not only does it still serve, after many reprints, as an indispensable 'painter's cookbook' in artists' studios all over the world, the book's influence also extends to art historians and restorers. The reason is that Doerner gives a highly convincing account of the painting methods of a number of important artists, including Van Eyck, Titian and Rubens, as well as Rembrandt. He did this moreover with such aplomb that there hardly seemed to be room for doubt. In his time, however, research a911methods were by no means sufficiently advanced to verify with any precision the details of the historic painting techniques he suggested. In developing his ideas he largely relied on observations of the paint surface and on copies he made himself. In copying paintings his intention was to sharpen his eye for the specific nature of the technique of the painter concerned.

Such 'reconstruction research' is still carried out today. It played a role, for instance, in the recent investigation of the binding medium in the paintings of Jan van Eyck.[2] Reconstruction research is only meaningful in case of an already existing body of knowledge, obtained either from historical sources or through scientific investigation. By means of putting hypothetical methods into practice, missing links in our knowledge can sometimes be traced. In Doerner's time, however, scientific techniques were still far too undeveloped to identify the materials – especially the organic ones – in detail. Also, radiographic analysis of the genesis of paintings was only in its infancy at that time, while the study of written seventeenth-century sources does not provide enough direct information in the case of Rembrandt's method of working.

Doerner proposed that Rembrandt worked on a monochrome underpainting.[3] This is in accordance with what we found with the early Rembrandt (see Chapter II). But in Doerner's account, this monochrome underpainting functioned as a pictorial 'skeleton' on which the final result, in the visual sense, was based. According to Doerner, the colour scheme which 'fleshed out' this tonal skeleton consisted mainly of transparent layers of paint through which he thought the tonal 'skeleton' determined the tonal values of the painting to a large degree. He was convinced that the translucency of these layers was due to Rembrandt's use of a resinous binding medium.[4] The fierce resistence, still widespread today, particularly in Doerner's native country Germany, to the idea of removing varnish from Rembrandt's paintings is partly due to this assumption, since the solvents used for dissolving the resinous varnish could, in theory, also dissolve the resinous glazes that Doerner postulated. However, the reluctance to clean old paintings existed well before Doerner's time. In the eighteenth

century, especially, value was attached to the so-called 'gallery tone', the patina that seemed to belong to old paintings. 'A good painting, like a good fiddle, should be brown', wrote Sir George Beaumont (1753-1827).[5] Indeed, these layers of old varnish may have contributed to Doerner's idea that the use of glazes was an essential constituent part of Rembrandt's technique.

Doerner's notion of Rembrandt's technique was also influenced by the fact that the translucency of oil paint increases in the course of time. In 1926, A.P. Laurie proposed the theory, still generally accepted, that this phenomenon was the consequence of the change of the refractive index in the course of the polymerization of the paint which causes light to penetrate further into the paint layer than at the time the painter had the work in front of him.[6] Small wonder then, that paintings aged this way should have led Doerner to his hypothesis that the essence of Rembrandt's technique was the use of a a917'glazing' technique, the systematic use of transparent paint. One might say that Doerner, with regard to Rembrandt, gave birth to a 'glazing-myth', which to this day has so obstinately persisted in many circles.

[h2] The Night Watch

One of the opportunities to test the validity of this myth was the restoration of the Night Watch in 1975 (see fig. 245). That was the year the painting was damaged in a knife attack and as a result required thorough restoration.[7] It had already been decided before that event that the layers of varnish needed to be removed entirely since they had lost much of their transparency. Fine fissuring had occurred within and between the old, brittle layers of varnish, scattering the light in such a way that, particularly in the darker parts of the painting, the three-dimensional effect, and with it the experience of the painting as a whole, was seriously impaired.

It was precisely with this painting, which owed its title, Night Watch, to the fact that it had been in a seriously yellowed condition over long periods of its existence,[8] that removing the varnish entirely was a controversial undertaking, if only because of the potential opposition from the patina-loving public – but also because of Doerner's 'glazing-myth'.

From restoration-historical research carried out by Van Schendel and Mertens in 1947 (with an eye to the possibility of partially removing the varnish at that time), it had become apparent however, that the painting had been treated at least about twenty-five times in the past, and that on one or more of these occasions the paint surface had been drastically overcleaned, even abraded in many places.[9] In fact the Night Watch has been handled so drastically in the past, that had there been glazes of the type assumed by Doerner, these would certainly have disappeared long ago. When the work was stripped of all its subsequent additions in 1975, the full extent of the painting's abraded condition emerged (fig. 255).

fig. 255Head of Banning Cocq during restoration, see fig. 257

During this restoration, the ideal opportunity arose to assess Rembrandt's painting technique – insofar as the state of the paint surface allowed. In particular, aspects of his method of working during the different steps he undertook to accomplish his pictorial aims could be investigated by means of microscopic analysis, the study of cross-sections a923of paint samples and X-radio-graphy.[10] The results of that research clearly refuted Doerner's ideas. But how is it possible to assert this categorically, when any glazes present would have been lost irretrievably long ago? For glazes, although essential in Doerner's eyes, were also vulnerable. However, it turned out that the painting still contains sufficient information to permit relevant conclusions in this matter. In the first place, in one specific part of the Night Watch, a glazed passage has come down intact – the red sash of Banning Cocq, the black-clad captain of the schutters (fig. 256). Where, in the history of painting technique, a deep saturated red was aimed at, transparent red lakes were often used (see p. 241-242).[11] These are organic colorants such as were used in textile dyeing, and which were prepared in such a way that they could be used as pigments for oil paints. As a rule, red lakes were applied over an opaque, red, reddish brown or white underlayer.[11] Subsequently, local detail was introduced onto the red glaze, in part with opaque paint (fig. 256). It was found that the red glaze on Banning Cocq's sash had remained preserved, in spite of the drastic restoration treatment it had been subjected to in the past. In other Rembrandts too, of both early and late provenance, the red lake is often still intact. In a painting similarly heavily cleaned, the Jewish Bride, it remained preserved in the glorious red skirts of the woman (see figs. 173, 195, 304 and 305). The chemical analysis carried out by Karin Groen demonstrated that the glaze in that case was not, as Doerner had assumed, bound with a resinous medium, but mainly with linseed oil, which is far less vulnerable to solvent action than a resinous mixture (see Chapter IX).

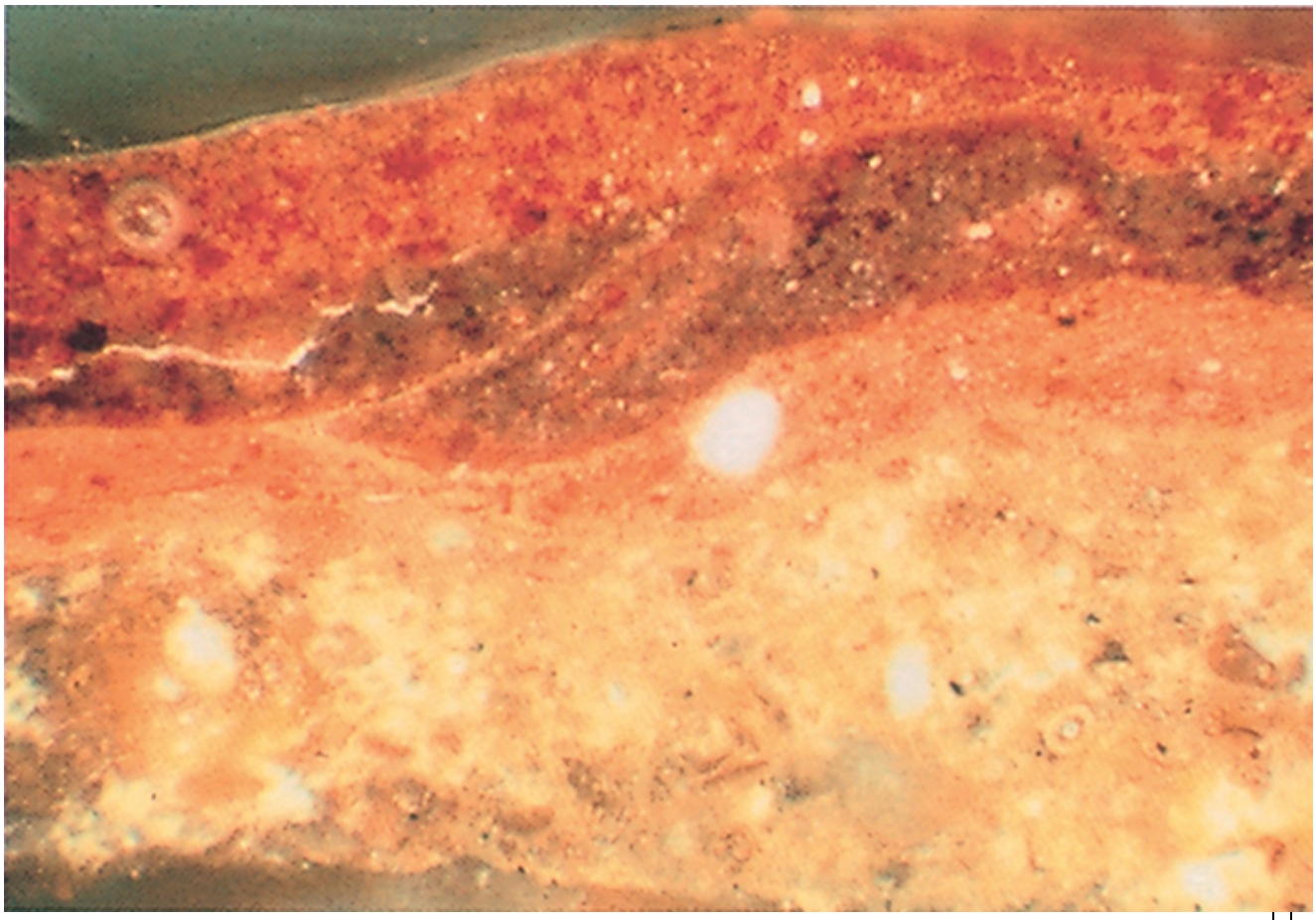

fig. 256Cross-section of the red sash of Banning Cocq in the *Night Watch*, see fig. 257

What then was the situation with regard to the other colours? Could it be that Doerner had been right about them, since another, possibly resinous or otherwise vulnerable binding medium might have been used with the other colours?

The analysis of cross-sections of paint taken from a number of the heavily abraded faces in the Night Watch revealed that these flesh tones, in their current condition, mainly consist of no more than a single layer of opaque paint (fig. 255). Did Doerner's glazes once cover the single layers of paint and have they subsequently disappeared? It will be hard to prove that this was not the case; on the other hand, it could be observed that the differences between these flesh tones all corresponded, from one figure to another, with the differences one can discern on an old copy of the Night Watch (figs. 257, 258). This copy by Gerrit Lundens (1622- shortly after 1683), as Gustav Glück has suggested convincingly, may well have been painted within seven years after the creation of its prototype.[12] Lundens' quite accurate copy is painted on panel on a much smaller scale and is still in very a928good condition. The correspondence between copy and original as far as the astonishing richness and variation in the flesh tones from one head to another is concerned, and also with regard to the other colours Rembrandt used, decisively rules out the possibility that Rembrandt, in Doerner's words,

> *introduced the local colour differentiation with thin, half-covering and translucent glazes applied over the grey core of the underpainting.* [13]

The Night Watch, as will be discussed on page 200, seems not to have lost its colouristic finesse. The painting has only darkened especially in the darker parts compared with the Lundens copy of the painting.

None of the above excludes the possibility that there could have been glazes that have since disappeared from the Night Watch; or that Rembrandt may have used glazes in other works. Occasionally, one finds blueish glazes applied on figures in the background of early paintings,[14] or greyish and pinkish glazes used in certain passages of faces.[15] However, these glazes seem to be as resistent to solvent action as the rest of the painting. We can nonetheless rule out the idea that the use of glazes in any way constituted the essence of Rembrandt's technique for differentiating colour as Doerner suggested.

Rembrandt's monochrome underpainting, the dead-colour stage, functioned in a totally different way than Doerner thought. In radiographic investigations of many of Rembrandt's paintings, comparison of the reserves of the foreground figures in a radioabsorbent background with the forms visible in the actual painting, usually reveals a considerable discrepancy between the underpainting and the finished work (See also figs. 29 and 30, 37 and 38). One encounters the same kind of discrepancies in the Night Watch (figs. 257, 259). We found the first trace of Rembrandt's underpainting of the Night Watch next to the boots of the brilliantly lit, yellow-clad figure of Lieutenant Ruytenburgh. A line applied with a free hand, in light paint, has become visible under the worn, darker paint to the left of the boots (figs. 260 and 261). This line is undoubtedly connected with an earlier shape of the boot. In other places too, as part of the dead-colour stage, heightenings in thick, light paint are to be found at some – sometimes considerable – distance from the corresponding passages in the final painting. It is clear that any conceivable correspondence between this underpainting and Doerner's 'grey core' is remote. In the Night Watch, as in his history paintings from the Leiden period, Rembrandt apparently used the dead-colour stage as a basis while developing the painting from the background forwards. During this process he could quite happily modify the original plan.

Investigating whether Rembrandt had also worked from back to front in the Night Watch, was not easy. Because of the extremely abraded state of the painting it was impossible to ascertain the stages of such a progression by assessing the overlaps from passage. Comparing the dark 'reserves' in the radiographs with the definitive forms to which they corresponded was helpful here (see figs. 257, 259).

fig. 257Rembrandt, *Night Watch* (detail), see fig. 245

fig. 258Gerrit Lundens, *Copy of the Night Watch* (detail). Panel, 66.5 x 85.5 cm. Amsterdam, Rijksmuseum, (on loan of the National Gallery, London).

a934As explained in Chapter II, 'reserves' are those parts in the dead-colour stage around which the painter works when completing passages that lie further back in the picture space. When completing the illuminated girl in the Night Watch Rembrandt worked around Banning Cocq's glove, the leg of the marksman in the purple trousers, and the butt of the musket of the red schutter. When a receding passage is painted with paint containing lead white, as in the case of the girl, this passage appears light in the X-ray image. The reserves for passages which were later executed in less radioabsorbent paint stand out dark in the X-radiograph.a935

fig. 259Partial X-ray of the *Night Watch* (see fig. 257)

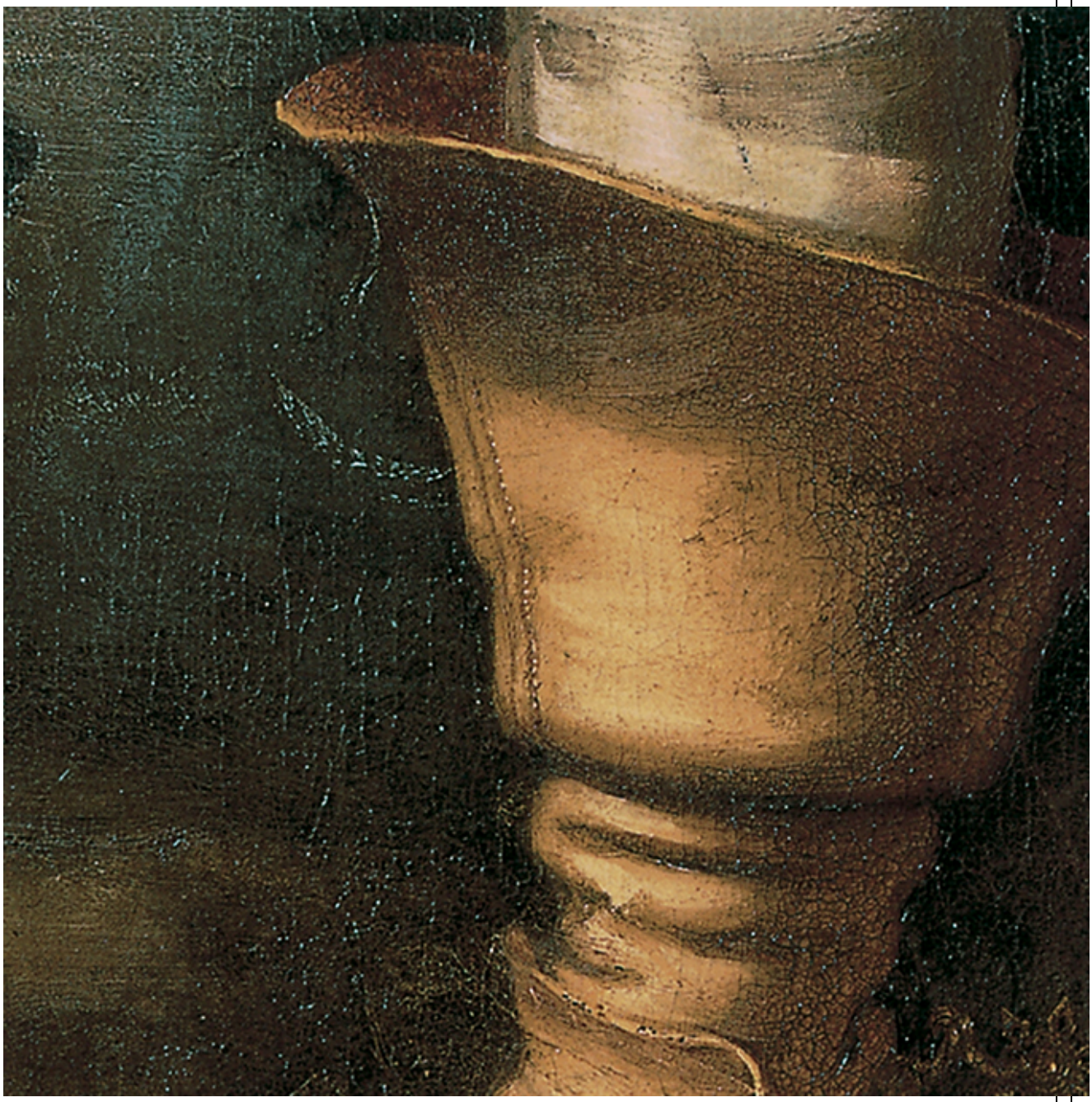

fig. 260Detail of the *Night Watch* (see fig. 245)

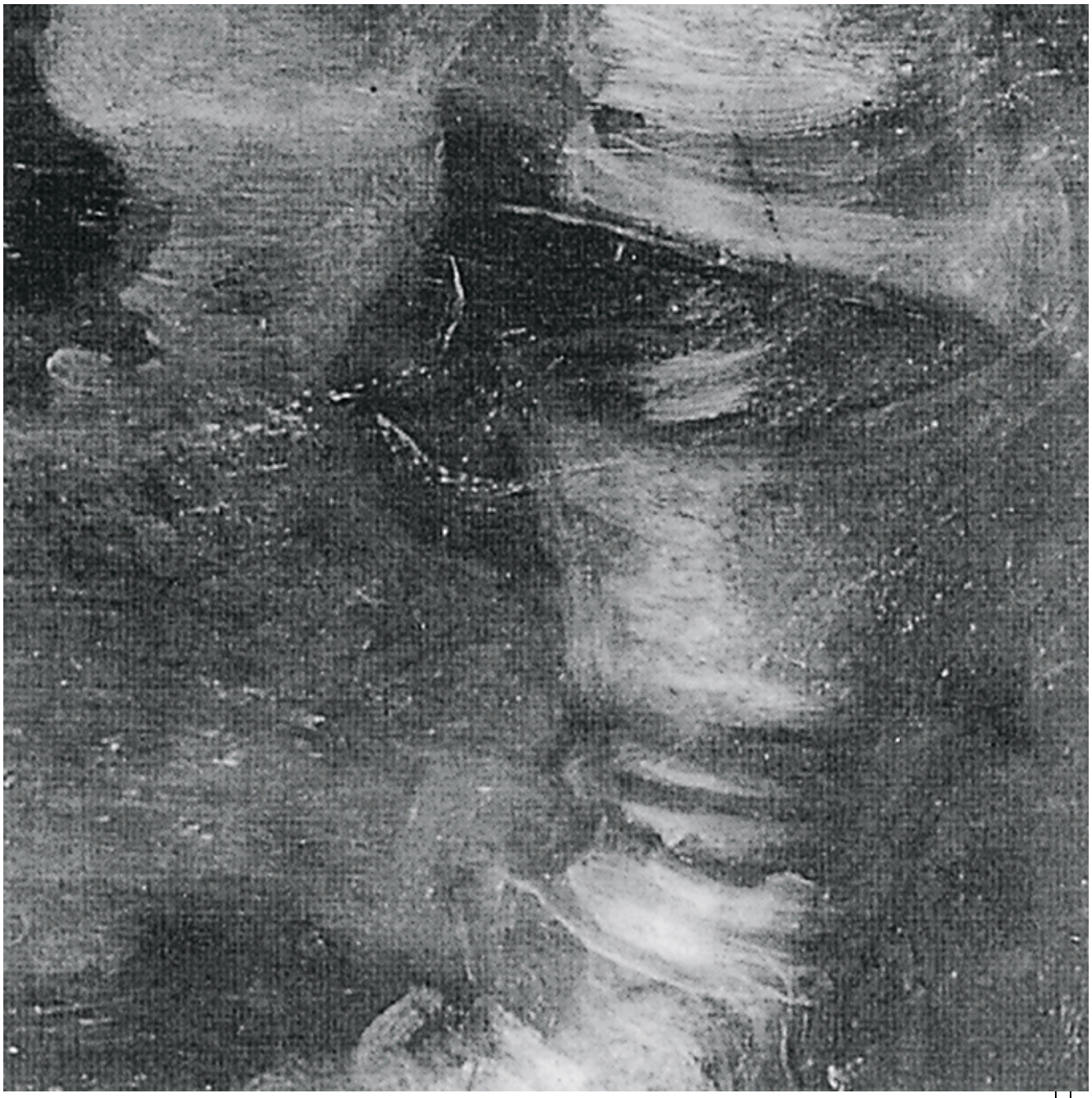

fig. 261X-ray (see fig. 260)

fig. 262Detail of the *Night Watch* (see fig. 245)

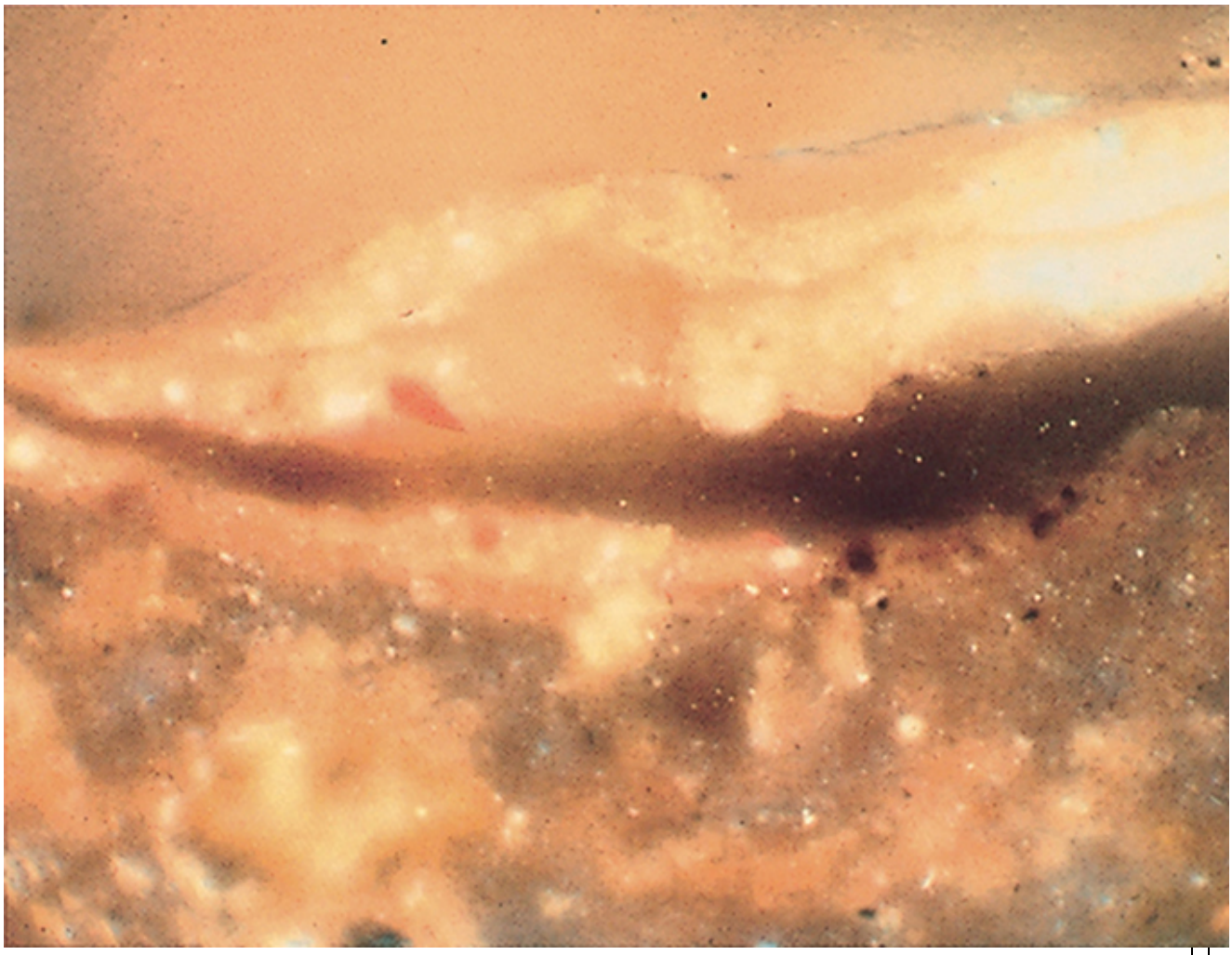

fig. 263Cross-section of the hand in fig 262. The sample has split during the preparation of the cross-section. Directly on the ground lies a light layer containing red pigment particles. On top of this layer (which is split) lies the final flesh tone

a941Such a reserve was no mere empty silhouette for the painter as he worked, but rather a space where he saw the monochrome sketch of the form concerned.

As a rule, the contours of the definitive forms exceed the outlines of the reserves for these forms. This is clearly visible in the musket and in the leg of the marksman. It follows that these figures were completed later than the girl and the lit step she is walking on, and therefore it is likely that the painting was carried out from the back forwards. Given the fact that the overlaps of forms further to the front are painted over paint belonging to forms further back, one has to conclude that the paint was not transparent but basically opaque. And, of course, this also contradicts Doerner's theory (for the rationale of this order of working see p. 32-42).

Traces of the dark and light paint used in the dead colouring were found in crosssections of paint samples. In a few places colour was found in the underpainting. The pointing right hand of the schutter on the right for instance had already been indicated in the underpainting in a pink colour (figs. 262, 263).

All in all, the features identified so far a942strongly suggest that at some point Rembrandt's Night Watch looked not unlike an unfinished work by Rubens, painted c. 1625 and preserved in the Rubenshuis in Antwerp (fig. 264).[16] On this most interesting document

of Rubens' working method one can see the freedom with which the rough sketch was drawn and painted on a cool grey ground (visible, for instance, in the cuirass of the rider on the right), with dark paint partly used in a semi-transparent fashion. Light heightenings are applied locally. In some passages Rubens also uses colour. The impression here is that introducing colour at that stage of the work had no other function than to enhance the legibility of a rather chaotically executed monochrome deadcolour stage. Rubens applied some flesh colour here and there, apparently in order to isolate a hand or a face amid the tangle of sketch lines and tones. The knight on the left is set on a red saddlecloth, apparently with no other intention than to clarify the complexly interrelated positions of the falling horse and its unseated rider. It is quite possible that Rembrandt, too, only applied colour (as in the case of the schutter's hand – see figs. 262, 263) to clarify the dead-coloured image in places.

fig. 264Peter Paul Rubens, *Henry IV in the Battle of Paris*, 1625. Canvas, 174 x 260 cm. Antwerp, Rubenshuis

fig. 265Rembrandt, *Portrait of a Boy*, c. 1655/60. Canvas, 64.8 x 55.9 cm. Pasadena (Ca), Norton Simon Museum of Art. The roughly sketched shape on the boy's left arm has been interpreted as a first indication of a falcon

a946

In addition, in the Rubens, the battle scenes in the background have already been fully worked out, so that as far as developing the painting from back to front is concerned, Rembrandt's technique must also have been similar to that of Rubens. These battle scenes in the background of the unfinished Rubens appear to have been painted by a studio assistant. As indicated in the discussion of the use of the palette in Chapter VI, the systematic a947production of paintings, as it emerges in the present book, enabled the master to leave some parts of a painting to be executed by assistants. Rembrandt's strong concern with the aspect of 'houding' in his work (see p. 149, 150, 255) makes it less likely that he involved assistants in his production in the same manner as is documented in the case of Rubens.[17] Moreover, the nature of Rembrandt's oeuvre – in which monumental compositions on the scale of Rubens' works are exceptions – also makes it less likely that Rembrandt would have systematically involved others in the production of his works.

From the above it should be clear that with regard to the laying-out of his paintings and the subsequent procedure of working them up there was no fundamental difference between the young Rembrandt, as dealt with in Chapter II, and the painter of the Night Watch.

[h2] The Late Rembrandt

Next one might ask whether any essential differences can be demonstrated between the working method of the late Rembrandt as compared to the one used in the Night Watch. The way in which the late Rembrandt set about the first stages of the painting process will be investigated in a number of unfinished paintings and a painting that (during its restoration in 1993) became 'accessible' because of the removal of later overpaintings from old damages caused by a fire in 1723.

In the 1650s and '60s Rembrandt, as with his earlier canvases, worked on grey or grey-brown, but also sometimes on ochre-brown, grounds (see fig. 269).[18] These grounds were in general darker than those of his earlier canvases. Von Sonnenburg surmised that Rembrandt first sketched with white chalk on these grounds.[19] He based his suggestion on the highly detailed studio scene by Rembrandt's pupil Aert de Gelder, where what looks like a crumbling piece of chalk is depicted among the other painting materials (see fig. 181). Preliminary sketches in white, certainly in the latter half of the seventeenth century, were not unusuaIn studio scenes like, for instance, Johannes Vermeer's Artist in his Studio in Vienna, one sees a sketch executed in white lines on the canvas the artist has on his easel.a952

fig. 266Detail of fig. 254

It is, however, unlikely that Rembrandt followed this procedure. As discussed in Chapter II, traces of a very first sketch, preceding the monochrome deadcolour stage, have been found in the Concord of the State, from circa 1640 (see figs. 26, 27). These lines, applied with a brush, show that in that stage of the work Rembrandt used dark paint occasionally heightened with light paint. The effect of that type of brush drawing can clearly be assessed in the torso and arms of an unfinished portrait from the middle or late 1650s (fig. 265). This

unique document of Rembrandt's late technique, the Portrait of a Boy in the Norton Simon Museum in Pasadena (Ca), has puzzled Rembrandt scholars to the extent that some of them could not believe that Rembrandt had painted it.[20] The uncertainty as to the attribution has prevented the painting from being used as a source for our understanding of the late Rembrandt's working method. I can see no reason to reject the a955painting. It will be dealt with later in this chapter. Traces of preparatory brushlines are occasionally found in other paintings as well, for instance in Jacob's elbow and along the contour of his sheet in Jacob's Blessing (see fig. 211).

Traces of the subsequently freely brushed underpaintings are frequently encountered in late Rembrandts. However, these traces are so diverse in nature that they seem to raise just as many new questions about the late Rembrandt's technique as there are answers to be found in the directly accessible passages. These questions arise mainly from the expectation that, as with the young Rembrandt, there ought to be a certain system in the order in which he worked in these late paintings. It will turn out, however, that the late Rembrandt seems to have proceded much more freely – although still within certain limits.

Parts of the Kenwood Self-Portrait (see fig. 254) offer a glimpse of a subdued tonal, though not strictly monochrome stage on which the painter subsequently elaborated with stronger lights and deeper darks at the same time defining and correcting the forms where necessary. This is in particular visible in the right part of the artist's headgear, and in the face (fig. 266). Upon the grey ground layer, which remained partly uncovered, the form of the artist's linen cap is provisionally indicated with an extremely free hand, the paint applied wet-in-wet. The spectacular broad strokes of white paint introduced in the following stage, painted in on the lit side, show that the form of the cap in this later stage only partly corresponds with the initial design. In the shadowed part of the face, one can see with what economy of means a first indication of the subdued light on the cheekbone has been created.

This method of working can also be observed, in much more detail, in another painting that has hardly ever been publicly exhibited. It is only half finished, even though Rembrandt signed it in this form (see on this issue p. 164). In this painting, the Portrait of an Old Man of 1667, in the collection of the Mauritshuis (The Hague), the manner of working described above on the basis of the Kenwood SelfPortrait can be followed easily (figs. 267, 268, 269). In the man's dress, specifically in the cuffs, and in the hands, the uncovered ochre-brown ground on which the subdued lay-in is painted, followed by the first highlights that only partially correspond with it, are all clearly legible.

In both paintings it is also evident that in the early stage of the process the old Rembrandt freely made use of lines and scribbles scored in the wet paint. In the Kenwood Self-Portrait (for instance in the left eyebrow and in the collar of the shirt) and in many places in the Portrait of an Old Man, it is clear that he provisionally introduced details and specifications into the form with this kind of rapidly incised scoring. The occasionally chaotic and in any case completely casual manner in which this was done suggests that we are looking at 'work in progress' in those places.

Both paintings, the Kenwood SelfPortrait (fig. 254) and the Portrait of an Old Man (fig. 267), also have in common that the background has been brought to a finished state with a subtle modulation of tonal values in opaque paint. At first sight, one might conclude that the old Rembrandt apparently continued to follow the custom of completing the background before the rest of the painting. As it turns out, however, when dealing with other late Rembrandts, this can no longer be taken as a rule of thumb. At this point two other unfinished paintings, the Moses with the Tablets of the Law in Berlin, dated 1659 (fig. 270),

and the Polish Rider in the Frick Collection of about 1655 (fig. 271), were developed differently.a956

fig. 267*Rembrandt, Portrait of an Old Man, 1667.* Canvas, 78.7 x 66 cm. The Hague, Mauritshuis

fig. 268Detail of fig. 267. The shadow in the right half of the collar shows the bare ground. Once this patch of the ground is located one finds it in other places as well

a959

fig. 269Detail of fig. 267. In the cuff the ground has only partly been covered. The white brush strokes at the lit side of the cuff correct the shape of the cuff as it was left in reserve in an earlier stage of the work (compare the cap in fig. 266)The size of the painting, and therefore also the edges along the truncated hand are original.

fig. 270Rembrandt, Moses Breaking the Tablets of the law, 1659. Canvas, 168.5 x 136.5 cm. Berlin, Gemäldegalerie

a962

In my view, based on stylistic arguments, these two paintings may in some details have been finished by later hands. However, this does not influence their assessment to such an extent that one cannot make any statements about the way they were developed. It is striking that in both cases the background is executed in a963transparent browns with some opaque passages. These backgrounds are executed so sketchily that it is legitimate to ask whether they conform to Rembrandt's final intentions. In both cases, the background gives the impression of being part of the dead-colour stage. In the case of the Polish Rider, it has only locally been developed further. On the other hand, parts of the figures in the foreground, sections of Moses in the one case and of the rider and his horse in the other, have been carried through much further, or even to completion. The quiver with its arrows, other items of his weaponry, and the costume of the Polish Rider have been a964worked out in the finest detail. In the case of the Moses, it would seem that the sleeves of his raised arms, and the tablets engraved with the ten commandments are completely finished. On the other hand, Moses' head and his hands are still in the state of a loosely executed sketch. The hanging parts of Moses' sleeves and his robe, hatched in long, thin, parallel brushstrokes are, it seems, the work of someone else. The same may be true for Moses' belt. Perhaps this unknown painter wanted to bring the painting to a presentable state in this way which would render it suitable for sale.

fig. 271Rembrandt, The Polish Rider, c. 1655. Canvas, 116.8 x 134.9. New York, The Frick Collection

fig. 272Rembrandt, Self-Portrait, 1652. Canvas, 112 x 81.5 cm. Vienna, Kunsthistorisches Museum

fig. 273Detail of fig. 272, showing the grey underlayer on which the face has been built

In the case of the Polish Rider, parts of the horse – its hindquarters, tail and the legs – and, for example, the rider's hands still seem to be in a preliminary state with the ground partly exposed. Some other parts, such as the shank of the boot and the folded-back tail of the coat and possibly his hose, may in my view have been completed by another hand. (In any case, the two hooves touching the ground are twentieth-century reconstructions on an added strip of canvas.)

In the light of Rembrandt's ideas on 'finish', as discussed in on page 164, it seems inappropiate to refer to the paintings discussed here as 'unfinished'. It is indeed an arbitrary opinion to consider these paintings unfinished in the sense that Rembrandt himself may have considered them as such. Did not Houbraken relate Rembrandt's words'that a piece is finished when the master has achieved his intention in it',[21] which would imply that an 'unfinished' work could be declared to a969be 'finished' by the painter. On the other hand, Houbraken leaves room for 'really' unfinished works when he stated – no doubt informed by his spokesmen Hoogstraten and Aert de Gelder, who had intimate knowledge of Rembrandt and his ways –:

> *But one thing is to be regretted and that is that he was so quick to change and move on to other things that many of his works were left only half-way finished.*[22]

There can be no doubt that Rembrandt must have considered the Portrait of a Boy (see fig. 265) as unfinished. Its genesis so far confirms the impression of the old Rembrandt

rather freely proceeding while at work. As with the Moses (see fig. 270) and the Polish Rider (see fig. 271), in this painting the background is left in a preliminary stage, loosely filled in with dark, translucent browns. As with those two paintings, different passages are in different stages of underpainting or completion. However, it becomes more obvious here than with any of the other four paintings dealt with so far, how important the ground is as a tonal basis for whatever follows. Its tone and colour guarantees that the painting under all conditions remains a painting, in the sense that there is a tonal and coloristic coherence from the onset. The 'painterly' brush-drawing develops the forms in such a way that the lines effortlessly become integrated into the image as it grows. It seems to be typical of the late Rembrandt's approach that he waits with the application of the highest lights until the last. That stage has not yet been reached in the Portrait of a Boy. As was discussed in the case of the London Self-Portrait of 1669 (see figs. 212 and 213), a process of reducing part of the light areas started after the highest lights were applied.

All five paintings dealt with above, however, equally confirm the importance Rembrandt must have ascribed to the tonal base of the background as an indispensable element in the work in progress to be applied at the earliest possible stage of the work. In that respect, Rembrandt did not change his basic procedure of working from back to front.

[h2] The Local 'Imprimatura'

Yet another surprising phenomenon has been discovered in the old Rembrandt's working method. It had already been noticed earlier that in late portraits (and self-portraits) a flat underlayer sometimes provided the basis for the painting of faces. Such an underlayer in particular shows through in shadow parts. Naturally, one's first thought is that this flat tone is the exposed ground, but it can also be a separate layer. In the large Self-Portrait in Vienna, a grey layer is ex-posed in the eye sockets and in the shadow of the moustache (figs. 272, 273). Although it does not differ essentially in colour from the ground layer, which can be observed along the edges of the painting, microscopic analysis has shown that the distribution of the black and white pigment particles is different from that of the ground. The authors of Art in the Making; Rembrandt found similar flat, underlying tones, for instance, in the Portrait of Jacob Trip of about 1661 in the a972National Gallery in London.[23] A possible solution to this rather enigmatic phenomenon was proposed by Martin Bijl, the chief restorer at the Rijksmuseum in Amsterdam, who came across the same phenomenon on a much larger scale during the restoration of the badly damaged fragment of the Anatomy Lesson of Dr Dey- man (figs. 274-280).[24] In 1723 this painting was in a fire.[25] To make it presentable the fragments that survived the fire were reassembled and heavily overpainted.

fig. 274Rembrandt, The Anatomy Lesson of Dr Johan Deyman, 1656 (after restoration). Canvas, 100 x 134 cm. Amsterdam, Amsterdams Historisch Museum

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fig. 275See fig. 274, during restoration, the overpaintings removed

fig. 276Rembrandt, The Anatomy Lesson of Dr Johan Deyman, 1656. Reed pen on paper. The drawing represents the original size of the painting (see fig. 274). It was made in connection with the design for a frame and its future diplay. The square shapes along the top represent the beams of a ceiling; the shape to the left is an opened window (see note 25)

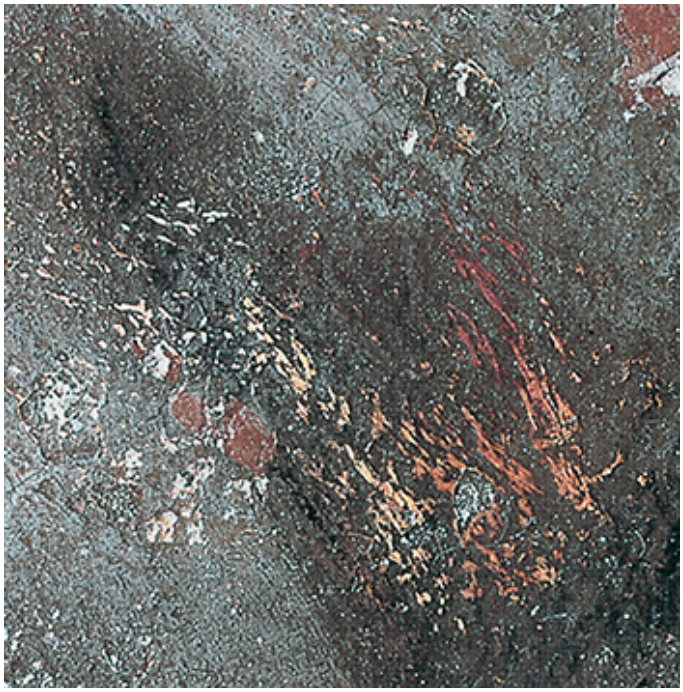

fig. 277Detail of fig. 275 showing red and yellow paint under the black and grey tones of the elbow of the figure to the left

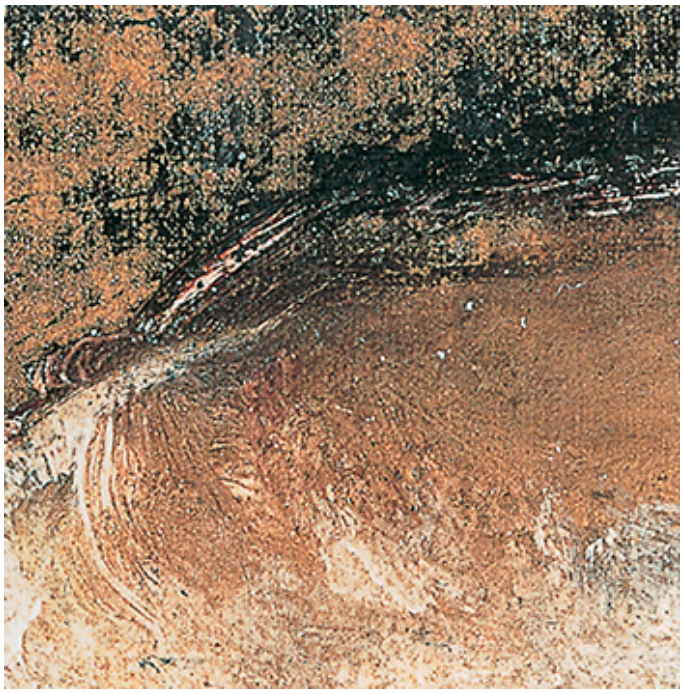

fig. 278Detail of fig. 275 showing a brown layer under the black costume and the crown of the skull

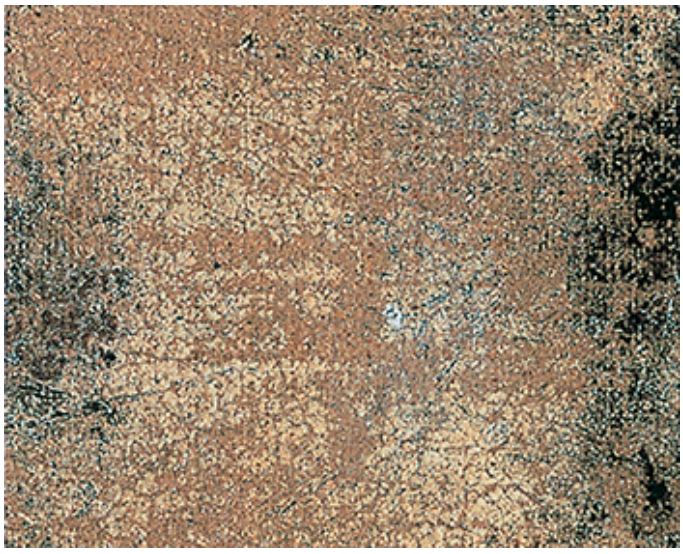

fig. 279Detail of fig. 275 showing a light grey layer on top of the grey ground, partly covered by the black of the costumes

fig. 280Detail of fig. 275 showing an almost black layer under the white drapery

During the recent removal of the overpaintings (fig. 275) flatly-applied layers were found that originally were hidden under the black paint of the clothes of the group of surgeons and other elements of the image. In the relatively well-preserved left figure, hints of underlying red and yellow could be found (fig. 277). Beneath the drooping black cloth that hangs from his arm, Bijl noticed brown on top of the grey ground (fig. 278); under the clothes of the figure, only one a984of whose hands is still visible, he found grey (fig. 279), and under the white cloth on the corpse there is a dark layer (fig. 280). The most obvious explanation for this technical phenomenon is that we are dealing here with a local imprimatura, in the sense of a locally applied coloured ground or underpainting used in the preparation of certain parts of the painting. How such a form of local imprimatura related to the different stages of the development of the painting, as discussed before, is not clear yet. One may safely assume that the painter first needed some form of preliminary sketch in order to know where these local flat underlayers had to be applied. In the case of Jacob's Blessing in Kassel blueish local inprimatura was found to lie on top of a dead-colourlike sketch (figs. 281 and 282). In certain respects, this manner of working seems to tally with a text of the English art lover Thomas Marshall, already discussed on p. 30, concerning the first stages of the work of Antonie van Dyck. According to Marshall's note, Van Dyck distinguished 'the sketch', almost certainly a mono-chrome oil sketch, as the earliest stage. On this 'sketch' [26], Van Dyck painted in what he called the 'maniera lavata', in a way that involved a flat filling-in of the separate passages in colour.[27] The difference with the phenomenon discovered in Rembrandt's Anatomy Lesson of Dr Dey man is that, whereas Van Dyck executed this 'underpainting' in the colour of the relevant passage (flesh colour in those parts where human skin is to be represented, red for red robes etc.), the colour of Rembrandt's local imprimatura seemingly has no relation to the final appearance of the passage. In the case of the Deyman, the reddish, yellowish, grey and brown zones (see figs. 277-279) were eventually covered with the blacks of the different costumes and other drapery. The white sheet covering the corpse is underpainted with a dark grey (see fig. 280). It would require a comprehensive investigation to discover the exact moment in seventeenth-century Dutch

painting when the switch occurred to the use of flat underpaintings in colour that did not correspond with the final appearance a987of the relevant passage.[28] The fact that a similar technique has recently been found to have been practised by both Rembrandt and Vermeer makes it all the more intriguing to investigate its history. The most important question is, of course, the function of this type of imprimatura.

fig. 281Rembrandt, Jacob's Blessing, 1656 (detail, see fig. 211). The bluish grey tint on which the boys shirt has been modeled appears to be a local imprimatura

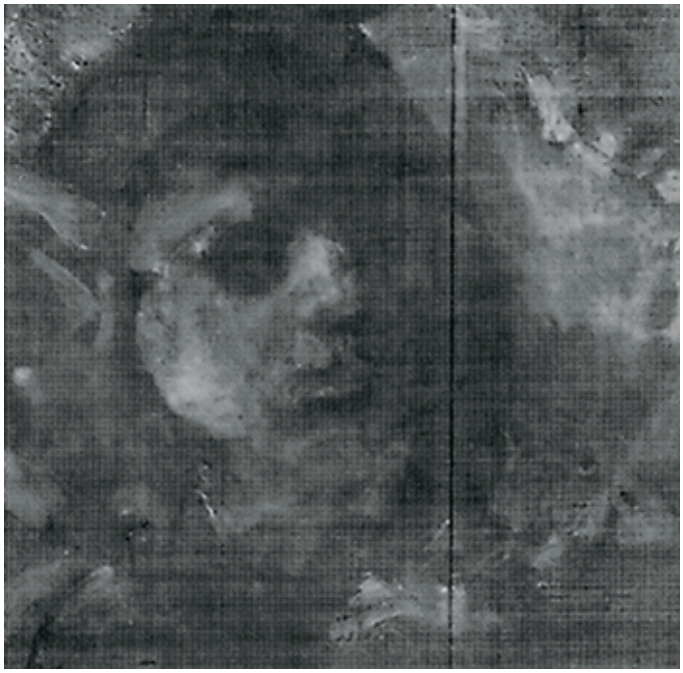

fig. 282X-ray of the detail shown in fig. 281. The light traces show that the paint-layer described in fig. 281 was applied on top of a sketch containing lead white

In the case of the Anatomy Lesson of Dr Deyman, one wonders if the differentiation of colours in the local imprimatura for the different figures could have served to help separate – especially in a spatial sense – the different blacks of the dark costumes. Applying such a method made it perhaps possible to avoid the use of a variety of mixtures with black to separate the figures, thus keeping the colour clean and the brushwork free and easy. In the light of the above discussion of Doerner's ideas on Rembrandt's technique, it should be acknowledged that a differentiation of the tints of local underpaintings under the different parts of the painting implies that Rembrandt must have taken into account a certain degree of translucency of his paint. This does not necessarily imply, however, that he used a glazing technique. The image of the 'safety net' – as used on page 22 in connection with the function of the coloured ground in the early paintings – is more appropiate here. Loose handling of paint implies that in thin parts of the brushstroke the underlying tone may show through more or less, thus influencing the character of the top layer.

Seen in this light, we seem to see here either the revival of a technique like the 'verdaccio' already employed by the early Italians, and still used by Michelangelo in his paintings – the flat underpainting in green onto which flesh tints were applied.[29] The flat layer found under faces in Rembrandt's later paintings may be similar in its function. It is normally a cool grey, sometimes a greenish grey (see fig. 285), which functions as a cool counterpart of the warm flesh hues and contributed to the coolness of the thinly-applied half tints of the flesh colours.

The investigation of this aspect of Rembrandt's painting technique is only at its beginning. It needs a separate project to continue on this path and find out to what degree the local imprimatura may have played a part in Rembrandt's pictorial ideas.

[h2] Elaborating the Flesh Tints

So far only the substructures and the succession of steps in the production of Rembrandt's later paintings have been discussed here. The manner in which the partially complex 'skin' of his paintings was formed has not yet been touched on, but this is precisely the most intriguing aspect of Rembrandt's painting technique, the one that left Koloff's connoisseurs with their magnifying glasses wondering if Rembrandt himself knew how he accomplished these effects (see p. 155). In the introduction of Chapter VII, some of these effects in the Jewish Bride were described in some detail. The question, however, is how these effects came about. In the following pages, the painting technique in the flesh parts, especially of the faces, will be discussed, as these are representative for the late Rembrandt's approach to painting and often are the most complicated parts of his work.a993

fig. 283Rembrandt, SelfPortrait, 1659. Canvas, 84 x 66 cm. Washington, National Gallery of Art

fig. 284Rembrandt, SelfPortrait, 1658. Canvas, 133.7 x 103.8 cm. New York, The Frick Collection

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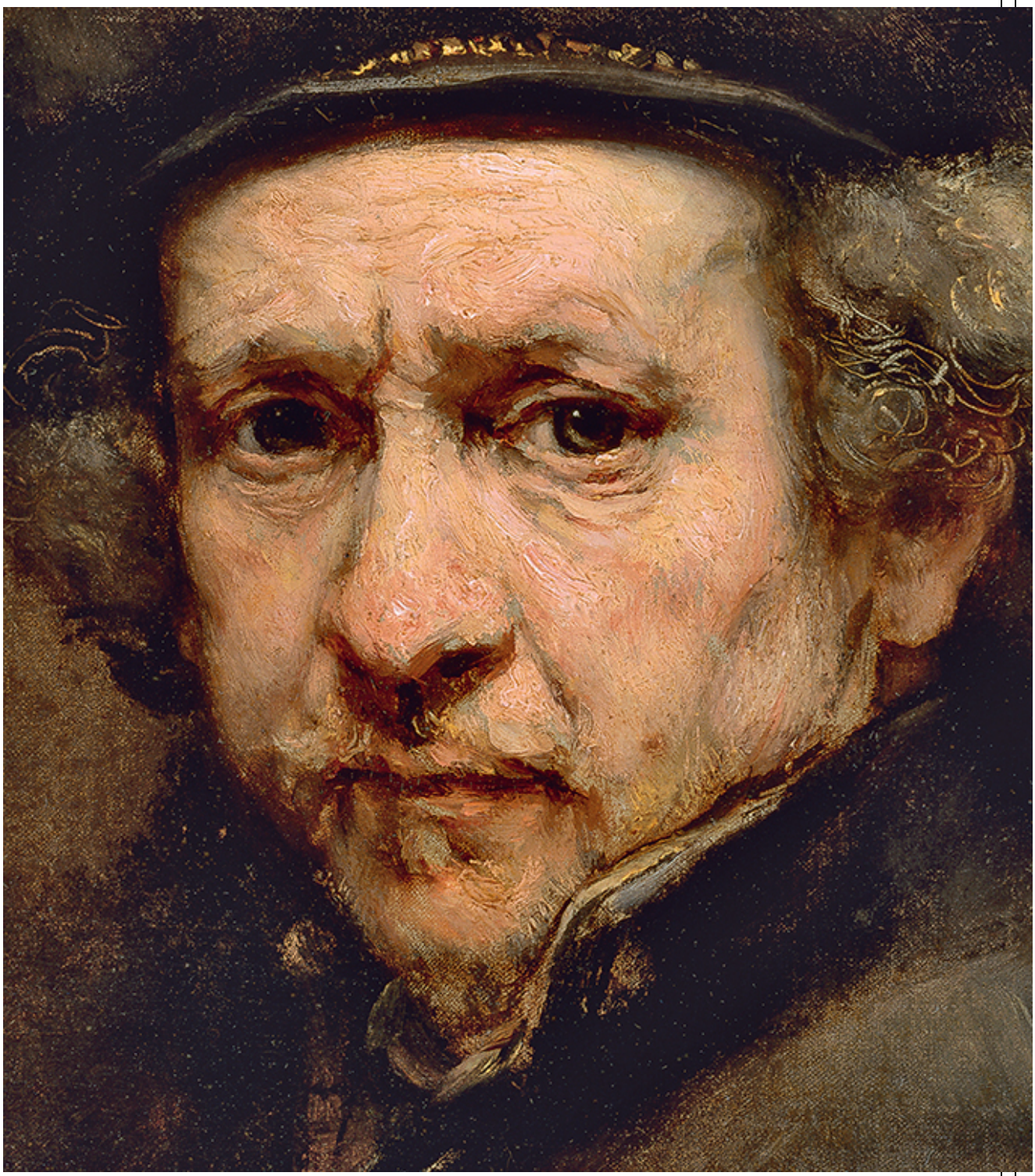

fig. 285Detail of fig. 283

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fig. 286Detail of fig. 284

a1000

a1001This seems a contradiction of what was said about the technique in the flesh parts in the Night Watch where a simple buildup was found in the faces. In the later portraits and self-portraits, however, the faces often have a more complicated layer-structure.

In looking for an answer to the question of Rembrandt's late technique, we need to go back once again to the underpainting, in particular to the heightenings introduced into it. Sometimes parts of this light underpainting have remained exposed, apparently because they were already considered to fulfil the pictorial intention aimed at. The hand of the Bathing Woman in the National Gallery in London (see fig. 210), sketched in the subdued tones as described above, serves as an example here. Parts of her white skirt, where the paint shows much more impasto than on the hand, also appear to be 'unfinished'. It would seem that such highlights were provisionally introduced during a relatively early stage of the work, aiming at the light-reflecting properties of the paint caused by the relief of the impasto. And sometimes such heightenings were just left like that.

The Self-Portrait from 1659 in Washington (figs. 283 and 285) also belongs to the category of those paintings where the painter must have decided at a relatively early stage that it was finished. Most striking about this painting is the crude manner in which the impasto is applied to the illuminated parts of the face. The paint seems to have been applied, as it were, with a shaving brush; the brush movement is scarcely related to the form to be represented. The creation of a light-reflecting relief would seem to be the sole intention here. In radiographs of other paintings by Rembrandt, traces of such thickly applied highlights can frequently still be seen. In the Self-Portrait under discussion, this stage of the work was apparently found to give the desired effect immediately. Normally this was not the case, however, and Rembrandt would then continue to work on this loosely laid-out design. Thinner paint was applied to the underpainting on which once again, executed in impasto, heightenings were added which eventually, in their turn, wholly or partially were

covered with thin paint. The so character-istic refining of the colours, the working of light and shade and the definition of form must all have 'grown' in this way (figs. 284 and 286). During this process, Rembrandt hardly strived for an exact definition of the plastic elements. The generally 'sketchy' brushstrokes added up to an image of rugged plasticity that is so characteristic of Rembrandt, even in such rounded forms as faces. It is indeed remarkable that the working method of such passages cannot be traced, despite the visibility of the individual strokes. This is what must have led to such confusion among Kollof's nineteenth-century connoisseurs with their magnifying glasses. An important cause of that confusion must have been the fact that the underlying pastose paint determined to a large extent the image of the brushwork while the visible differences in colour and tone do not correspond with that underlying pattern of brushstrokes: in fact, the form dissolves time and time again in the seemingly autonomous brushwork. The suggestion of form is mainly evoked, by a1002a richness in the texture which seems to have been created very casually.

When comparing the head of the Self-Portrait in Washington (see fig. 285) with the head of the Self-Portrait in the Frick Collection (see fig. 286), it is immediately apparent how essential the differences in technique are. I hope, however, that the above discussion has made it clear that these differences are of a gradual rather than a fundamental nature. One could say that, in a sense, the Washington Self-Portrait represents an early stage of the Frick portrait. One has, however, to take into account one essential difference between the two paintings: whereas the face in the Frick Self-Portrait, as frequently with Rembrandt's self-portraits, is only partly lit, due to the light coming from top left, the face in the Washington Self-Portrait is almost fully turned to the light. This requires a fundamentally different dealing with the lit elements of the face (one finds the same lighting situation with the Cologne Self-Portrait as Zeuxis, see fig. 306).

A striking aspect of the Washington Self-Portrait is that, in spite of its relatively rough execution, it has just as much an atmospheric quality as the more thoroughly worked paintings like the Frick Self-Portrait. In this connection, seventeenth-century ideas about the 'thickness of the air' were discussed on page 187. One of the means by which this atmospheric effect could be achieved can be read from Rembrandt's face and the thick tuft of grey hair in the Washington Self-Portrait: some elements are, so to speak, 'in focus', while the passages on which they are placed still have a degree of 'cloudiness' which gives the viewer the feeling that they are 'out of focus'. This interaction of sharp and blurred elements continuously stimulates the beholder's eye to explore the spatial illusion of the image instead of taking for granted what it sees as in the work of so many other artists who faithfully 'describe' the reality that is suggested. Part of that interplay of sharp and blurred elements is also determined by the presence of concrete, as it were, tactile lumps and cavities in the paint surface that may act as elements that are in focus as compared to blurred brushstrokes often determining the overall impression. Here we touch again on the seventeenthcentury concept of 'kenlijkheyt' (perceptibility) discussed on page 182.

In both the self-portraits under comparison, and in many of his other works, a strong fascination is exerted by the combination of the casual manner in which Rembrandt's hand sets to work and the impression of great precision with which painterly intentions seem to be realized. The interplay of the visual cues provided by the painter and the beholder's willingness – in fact compulsion – to project some reality onto these layered and veiled brushstrokes on the other hand, makes looking at Rembrandt's paintings such an inspiring and intriguing activity.

The description given here of the late Rembrandt's technique may suggest that the apparent freedom of action during the work process would have called for a different use of the palette than described in Chapter VI. The younger Rembrandt clearly worked in

'giornate', completing passage after passage according to particular formulas (see page 140), whereas in his late work a continuous painting a1003process seemed to prevail, which would suggest that Rembrandt, like Cézanne, worked on the whole painting at once (see p. 33). The question one should ask therefore is whether Rembrandt worked here with a more complete palette, ready to serve each fresh impulse in just the way Jozeph Israëls surmised (see p. 134).

We should realize, however, that the process of creation described above does not seem to have been a continuous one. The compartmentalization of the different elements of the painting forbids such an image of the late Rembrandt at work (see also fig. 265). In this regard, a comparison between Rembrandt the painter and Rembrandt the etcher is revealing. The etcher is accustomed to let his work come into being through a series of different stages – the 'states' the etching plate undergoes (see figs. 45 and 46): the work of art as a game of chess in which many moves have to be considered in advance and in which a remarkable combination of calculation and creativity is required if the final outcome is to be a success. On the basis of the reconstruction of the late Rembrandt's painting technique given here, one might wonder whether Rembrandt the painter did not approach the process of painting in the same way as Rembrandt the etcher approached etching. It may well have been this curious combination of calculation and spontaneity that kept fuelling Rembrandt's creative drive (compare figs. 286a and b).

fig. 286aRembrandt, Landscape with a castle, c. 1645. Panel, 44.5 x 70 cm. Paris, Musée du Louvre

fig. 286bRembrandt, St. Jerome reading in an Italian landscape, c. 1653. Etching, burin and drypoint, 25.9 x 21 cm

a1006

[h1] IX The Search for Rembrandt's Binding Medium

DOI: 10.4324/9781003702764-9
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fig. 287Detail of fig. 175.

[h2] Questioning the Painter's Eye

In Chapter VII variousS possible approaches to Rembrandt's 'rough manner' were discussed. In that context, it was suggested that Rembrandt, together with his Leiden townsman and

colleague Jan Lievens, experimented with the consistency of his paint in order to render the diverse characteristics of the materials to be depicted more convincingly. Gold brocade, leather, human skin, shining wood, deteriorating paper – the young painters treated these all differently by varying the texture of the paint surface and the high lights on these textures (see figs. 223-225). The question was posed whether these effects, and in particular those created by the late Rembrandt, who continued on this path though in a less literal way (see figs. 240-242), might have been achieved by adding specific substances to the paint in order to differentiate its consistency and brushability.

Over the centuries it was for the most part painters who tried to find an answer to this question, which increasingly intrigued art lovers and painters alike. The reader may remember that the nineteenth-century painter and writer on Dutch and Flemish art, Eugène Fromentin (see fig. 5) even called Rembrandt an alchemist.

The Englishman Charles Lock Eastlake, painter and connoisseur, President of the Royal Academy, and from 1855 to 1865 Director of the National Gallery in London (fig. 288), published in 1860 his view on Rembrandt's technique in his Methods and Materials of Paintings of the Great a1012Schools and Masters. It is worthwile to quote him extensively, as Eastlake's descriptions lead right to the heart of the matter. With reference to the portrait of Margaretha de Geer (figs. 289, 290) he writes:

> *the surface is... diversified, sometimes rougher and more solid, sometimes more evanescent. [...] The richer portions of this picture are probably painted with such a vehicle [binding medium] as 'vernice liquida' in all its original thickness, rendering sufficient drying [...] The quantity of vehicle used by such a painter as Rembrandt in such effects is scarcely conceivable by modern artists; but it is plain, from inspection of many of Reynolds' works, that the founder of the English school very commonly aimed at this method [see fig. 292]. He sought to give the requisite body, combined with more or less transparency, by means of wax very copiously used, and with what unfortunate results his pictures often tell. It does not appear likely that Rembrandt used wax [...] To return to the portrait referred to [see fig. 290]: It is plain, from the sharp, arrested, unmixing touch in the head, that the flowing vehicle was exchanged in this case, for essential-oil varnish, mixed in due quantity with the colours ground in oil. No other vehicle of the oleaginous kind produces this unmixed, abrupt, unflowing appearance more completely. But the flowing quality can be no objection to a glazing vehicle, and it is therefore probable that, except when a rapidly drying surface was wanted, the transparant glazes were in all cases applied with a oleo-resinous, and more or less thick medium. For the lights, the purest bleached oil, with mastic or even fir-resin, would be preferable to the dark 'vernice liquida', and the dryer might be of sugar of lead, in moderate quantity, instead of gold size [lead oxide]. The preparation of the lights in Rem-brandt's heads appears to have often been cool, and the quick-drying, broken, and arrested masses and touches that are applied on it, leave the cool tints of various degrees of darkness half visible at edges and uncovered dragged portions, as it were, through them.*[1]

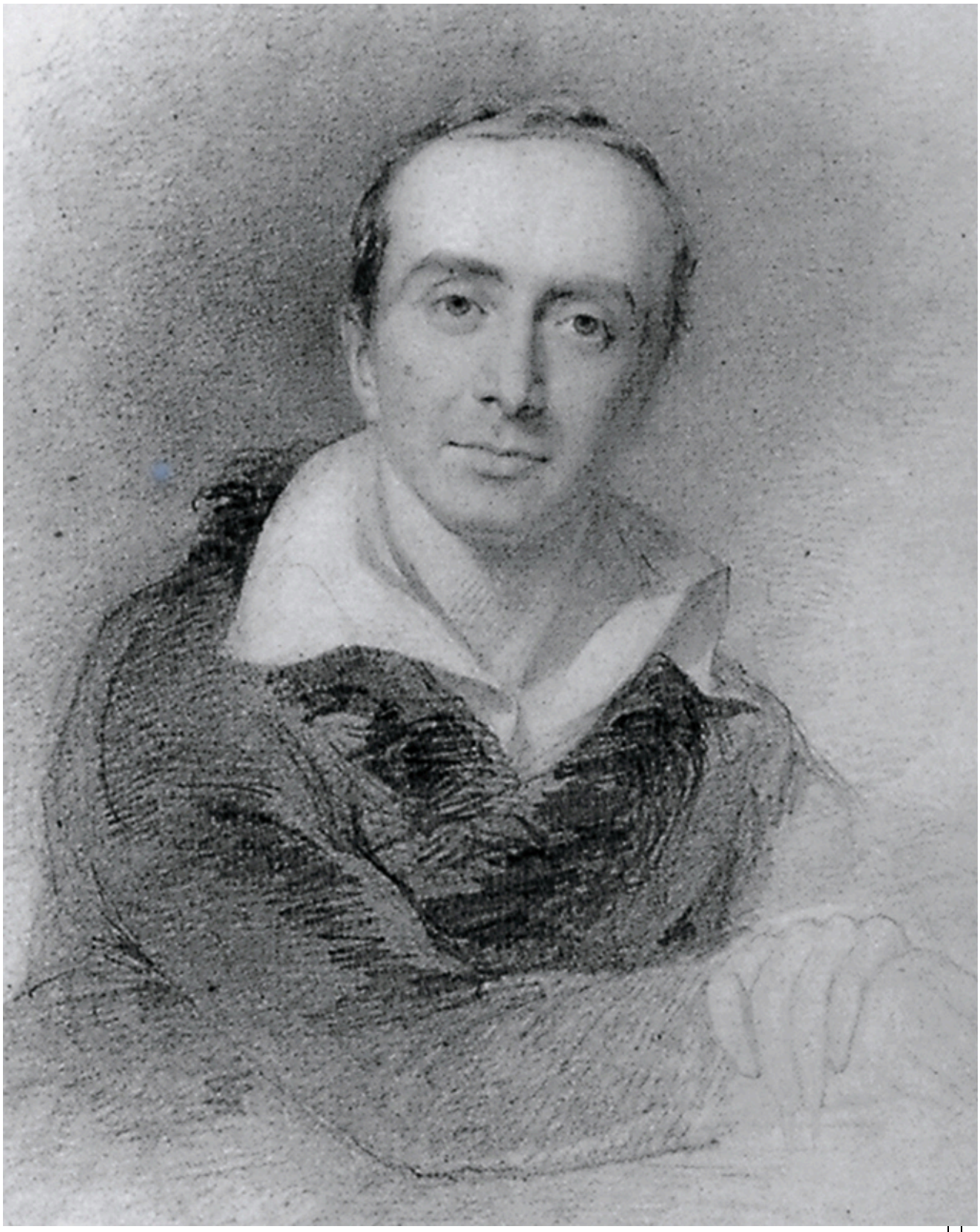

fig. 288John Partridge, Portrait of Sir Charles Lock Eastlake, 1825. London, National Portrait Gallery

fig. 289Rembrandt, Portrait of Margaretha De Geer, Bust Length, 1661. Canvas, 75.3 x 63.8 cm.London, National Gallery. I do not share the doubts about the authenticity of this painting as expressed in Art in the Making

fig. 290Detail of fig. 289

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a1018In this loving description Eastlake evokes the image of Rembrandt as a painter who, indeed, consciously varied the type and quantity of his binding medium and also added substances selectively to speed up the drying process of the paint in order to obtain certain effects. What Eastlake is trying to account for in particular is – as he puts it – the ‘requisite body', the ‘abrupt, unflowing appearance' and ‘quick-drying, broken and arrested masses' of

the paint in certain passages of Rembrandt's paintings; and he was convinced that only the addition of resin to the oil paint could have influenced the paint in this way.

Another aspect of Rembrandt's technique, which Eastlake's analysis particularly focused on, was the rather transparent quality even thickly applied paint possesses. The fact that the translucency of the paint of an old picture increases through ageing was not known at that time (see p. 194). According to Eastlake, Reynolds (fig. 291) tried to achieve that translucency by adding wax in generous quantities to his paint (fig. 292); but the way his paintings have aged proved in Eastlake's eyes just how mistaken Reynold's reconstruction of Rembrandt's technique had been.[2] What about Eastlake's own theory? Did Rembrandt really add substances to his paint like '"vernice liquida" in all its original thickness, rendering sufficient drying', an 'oleoresinous, more or less thick medium' or 'essential-oil varnish', to achieve the transparency of the paint and its varied surface effects?

At the time Eastlake wrote his book it was impossible to verify his assumptions about Rembrandt's use of a binding medium for a lack of the appropriate analytical chemical methods. This was still true at the time the restorer Jacques Maroger speculated about Rembrandt's binding medium in his book The Secret Formulas and Techniques of the Masters, which appeared in New York in 1948. Like Eastlake, he looked with a painter's eye while at the same time drawing ideas a1020from historical recipes which, however, had no direct connection whatsoever with Rembrandt's studio practice. Maroger, with the same assuredness with which Eastlake had contradicted Reynolds, returned to Reynolds' idea that the clue to Rembrandt's technique can be found in the addition of wax to his medium.[3]

fig. 291Sir Joshua Reynolds, Self-Portrait, 1780. Canvas, 18o x 15o cm. London, Royal Academy of Arts

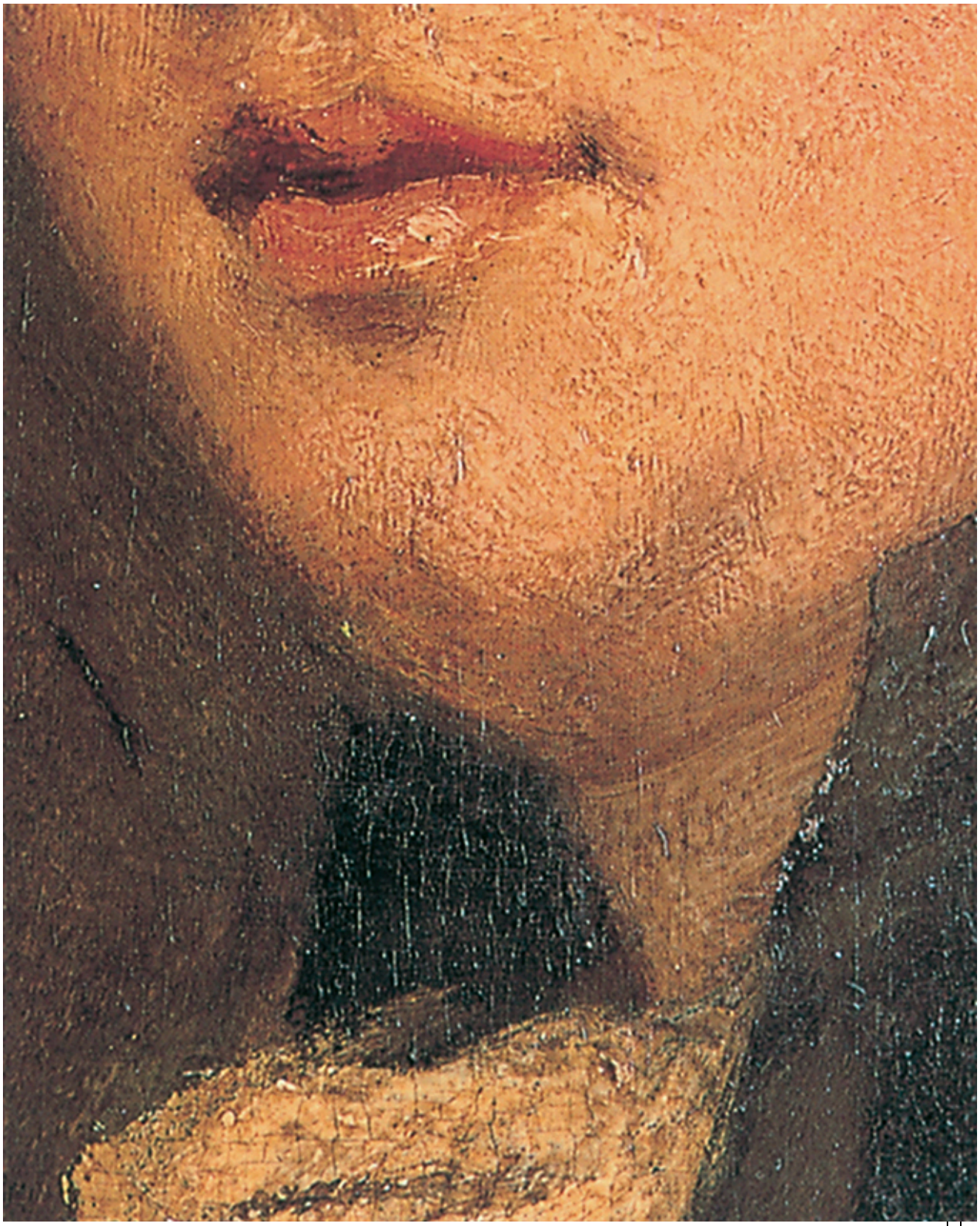

fig. 292Sir Joshua Reynolds, Portrait of George IV when Prince of Whales (detail). Panel, London, Tate Gallery. Chemical analysis has shown that a mixture of bee wax and mastic was used as the binding medium throughout the painting

Only today, by the end of the twentieth century, have analytical methods become so refined that the tiny paint samples, which – under certain conditions – are allowed to be taken from some of these precious paintings, can be analyzed in considerable detail in search for the binding medium. It seems appropriate that it was in the same National Gallery in London, whose director Eastlake once was, that the first systematic analyses of Rembrandt's binding medium were carried out. In the context of the preparations for the catalogue of the exhibition Art in the Making; Rembrandt, in 1988/89, the chemist Raymond White from the National Gallery Scientific Department, analyzed the binding media in the National Gallery's paintings by Rembrandt.[4] The matter-of-fact presentation of the table showing the results of his investigation of the works ascribed to Rembrandt (see table A, p. 230) contrasts strikingly with the lyrical vein in which Eastlake wrote about the diversified manner in which he thought Rembrandt had manipulated the consistency of his paint by varying his binding media.

The outcome of White's research was that

Rembrandt had a preponderance to linseed oil as binder of his paints.

He added:

One may say that in general a sound medium – linseed oil – has been employed in an uncomplicated way, that is, without detectable additions of other materials.

Only in some instances did he find walnut oil instead of linseed oil. Walnut oil tends to yellow less than linseed oil and therefore was sometimes used for white and blue passages. In some cases Raymond White thought he had found that Rembrandt's oil had been heated, apparently in order to increase its thickness. He found some resin in the Margaretha de Geer portrait which Eastlake had scrutinized so closely, but only in the dark background (and there possibly in a retouching). The light impasto that had so attracted Eastlake's attention did not contain any resin, nor in the Margaretha de Geer (see fig. 289) nor in any other Rembrandt in the National Gallery, neither did he find a trace of the wax considered by Reynolds, Maroger and others as the clue to Rembrandt's technique.

We have seen in the case of Jozef Israëls' anachronistic ideas about Rembrandt's use of the palette (Chapter VI), and of Doerner's erroneous ideas about Rembrandt's glazing technique (Chapter VIII), and we see it again with the contradictory ideas of Reynolds, Eastlake and Maroger: that the painter's eye – with however much empathy it scrutinizes Rembrandt's paint surfaces – apparently does not reveal the truth about his technique.

[h2] Questioning the Scientists' Results

On the other hand, would the mystery of Rembrandt's rich pictorial effects have been solved by the National Gallery's scientific research? Was Rembrandt's paint, indeed, no more than a mixture of pigment with a more or less viscous oil, ground with a muller on a grinding slab and (sometimes with the addition of some anorganic dryer) brushed onto the panel or canvas? If that were indeed the case, the metaphor of the violin bow would be appropriate here[5]: the impact of this rather simple implement on the richness of the musical effects depends almost entirely on the talent, skill and imagination of the musician who handles it. The same violin may sound either utterly dull or heavenly rich just from the way in which the same bow is handled. The parallel between the violin bow and the painter's brush is tempting, as it would then solve the problem: Rembrandt's pictorial richness is exclusively determined by the talent, skill and imagination with which he wielded the brush.a1027

Table A. Asurvey of Rembrandt's paint medium as analysed by Raymond White, The National Gallery, London (Art in the Making 1988, p. 28/29)

PICTURE	DATE	SAMPLE	MEDIUM
Judas and the Thirty Pieces of Silver	1629	1. Ground, upper layer 2. Ground, lower layer 3. Black of floor 4. Grey-green background	Linseed oil Linseed oil (?) Linseed oil Walnut oil
Portrait of an 83-Year-Old Woman	1634	1. Light fawn background to left of sitter 2. Black paint of dress	Linseed oil Linseed oil
Saskia van Uylenburch in Arcadian Costume	1635	1. Grey-white of bottom of dress 2. Dark black/brown of foliage, top	Walnut oil Linseed oil
The Lamentation over the Dead Christ	*c.* 1635	1. Warm white impasto, RH edge 2. White cloud, by cross, upper LH edge 3. Mustard colour, by white shroud 4. Darn brown/black background, RH edge	Alkyd Poppyseed oil Linseed oil Linseed oil
Belshazzar's Feast	1636–8	1. White impasto of robe 2. Yellow impasto of robe trimmings 3. LH woman's head-dress, shadow 4. Red dress of RH woman	Linseed oil Linseed oil Linseed oil Linseed oil
Self-Portrait at the Age of 34	1640	1. Light brown parapet, RH side	Walnut oil
The Woman taken in Adultery	1644	1. Dark impasto, top of centre column 2. Pale orange-brown of RH column 3. Ground 4. Red background, top RH edge	Linseed oil Linseed oil Linseed oil Linseed oil

PICTURE	DATE	SAMPLE	MEDIUM
The Adoration of the Shepherds	1646	1. Black background 2. Ground 3. Mustard highlight of roof beam, LH edge	Linseed oil Linseed oil Linseed oil
A Franciscan Friar	*c.* 1666	1. Brown habit 2. Pale buff paint, top edge 3. Grey-blue background	Linseed oil Walnut oil Linseed oil
Portrait of Hendrickje Stoffels	*c.* 1656	1. White highlight of robe 2. Red background	Walnut oil Walnut oil
A Bearded Man in a Cap	1657	1. Black coat 2. Ground	Walnut oil Walnut oil
An Elderly Man as Saint Paul	1659	1. Black sleeve of robe 2. Reddish brown, upper RH corner	Linseed oil Linseed oil
Portrait of Jacob Trip	1661	1. White scarf, right shoulder 2. Reddish brown, side of chair 3. Black, bottom of cane	Walnut oil Linseed oil Linseed oil
Portrait of Margaretha de Geer	1661	1. White ruff 2. Brown background 3. Ground	Linseed oil Oil + egg (?) Linseed oil
Portrait of Margaretha de Geer, Bust Length	1661	1. White impasto 2. Black background	Linseed oil Linseed oil + resin
Portrait of Frederik Rihel on Horseback	1663	1. White impasto, jacket trimmings 2. Red impasto, cuff trimmings	Linseed oil Linseed oil
Self-Portrait at the Age of 63	1669	1. Dark brown, right sleeve 2. Olive-brown background at top edge 3. Ground	Linseed oil Linseed oil Linseed oil

a1029

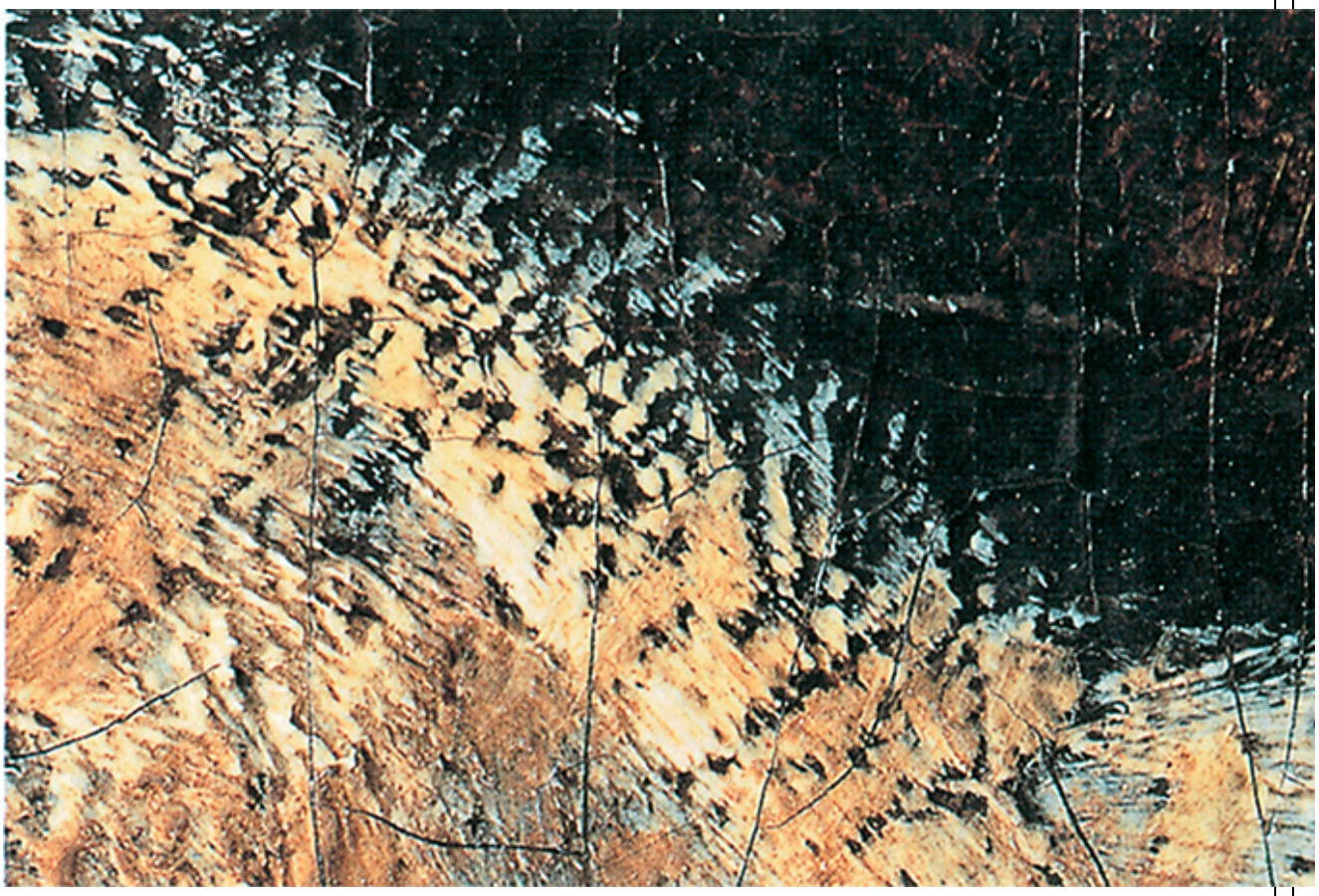

fig. 293Rembrandt, Flora, 1635 (detail). Canvas, 123.7 x 97.5 cm. London, National Gallery (Br. 103). Contour of the sleeve

fig. 294Rembrandt, Flora, 1635. Detail of the hair

fig. 295Rembrandt, Flora, 1635. Flower against lit sleeve

fig. 296Rembrandt, Flora, 1635. Detail of embroidered bodice

a1034

There are reasons to believe that this shift in point of view does not eliminate the problem. What to think of Hoogstraten's enigmatic remark on Jan Lievens being 'expert in seeking wonders in smeared [aengesmeerde] pigments, varnishes and oils' (already quoted on p. 176),[6] and the fact that Rembrandt, once Lievens' companion, a1036may well have been Hoogstraten's spokesman on this matter. Moreover, Rembrandt's paint indeed seems to have a variety of properties, or at least shows a range of effects which seem impossible to achieve with paint of a uniform composition of pigment and oil alone. Rembrandt's paint sometimes had a certain 'shortness' which resulted in tracks of the brush which are interrupted the moment the paint breaks off, when it sticks to an underlying ground or paint layer. In other passages the paint remains, after it left the brush, in rounded 'hills' which betray a paint substance with a certain 'flow'. It can also be dragged with great speed leaving long tracks of paint with enough body to reflect the light on its smooth furrows. In other cases the furrows betray a more resistant, almost unmanageable consistency (figs. 293-297b). Paint behaving in so many different ways seems to be more than just pigment and oil. It has a variety of potential properties of a completely different rheological nature (rheology being the study of the flow properties of plastic materials, as will be discussed below in more detail).[7]

fig. 297aRembrandt, Portrait of a Man, 1667. Canvas, 108.9 x 92.7 cm. Melbourne, National Gallery of Victoria. Detail of the face and hair

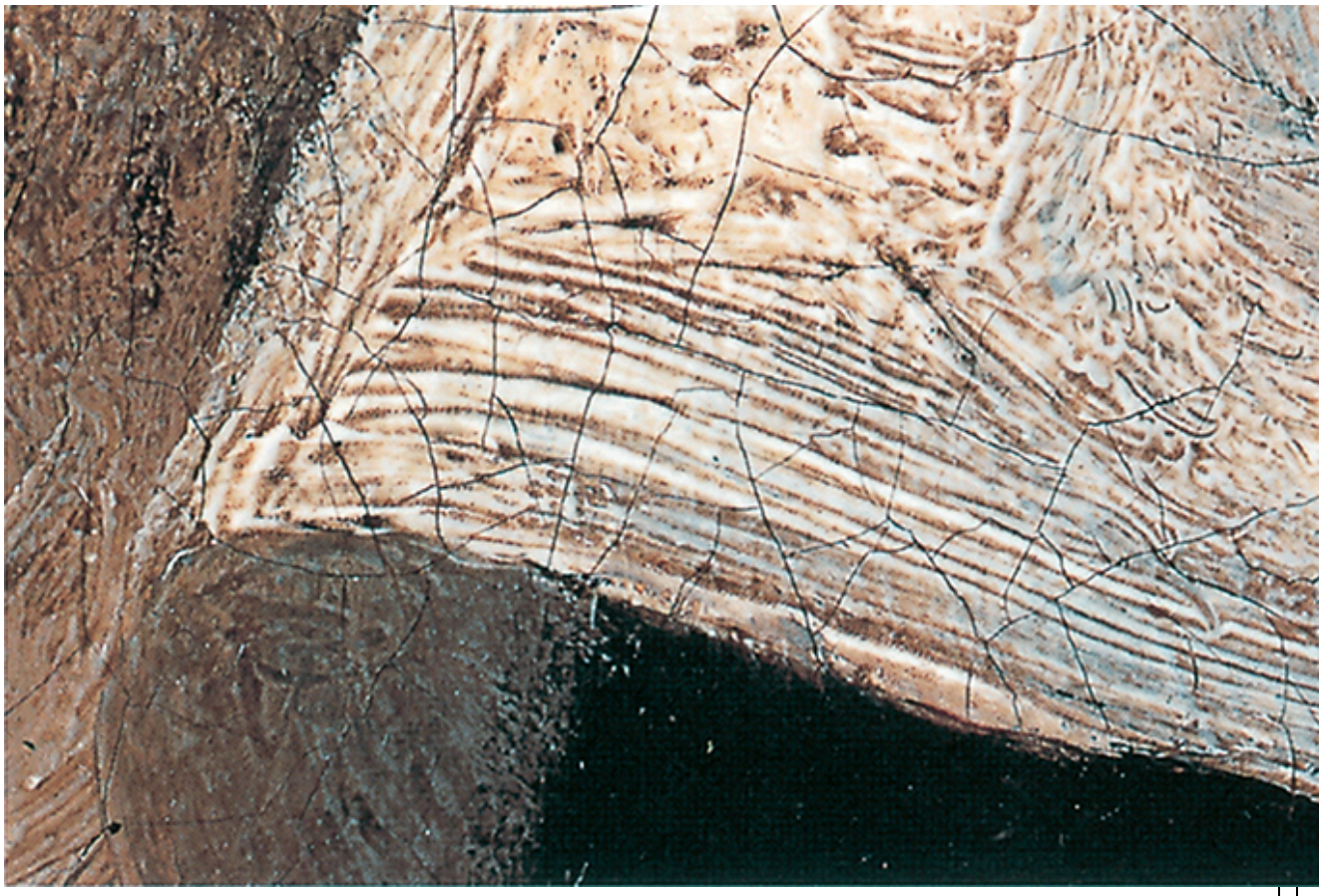

fig. 297bRembrandt, *Portrait of a Man*, 1667. Canvas, 108.9 x 92.7 cm. Melbourne, National Gallery of Victoria. Detail of the collar

By emphasizing the contrast between the rich variations in the consistency of Rembrandt's paint and the supposed limited properties of an oil-pigment paint, it appears as if the National Gallery's analytical results are being questioned. Hasn't the truth about a matter been revealed once a respected laboratory has done its research, and interpreted and published its findings? In fact, there are always reasons to reconsider the outcome of scientific research. By rethinking hypotheses, rephrasing research questions, by expanding the repertoire of analytical techniques and, where possible, refining those analytical techniques themselves, one may move on to new tracks of research in the same field. This is true for the natural sciences as well as for the humanities and it is an essential part of the dynamics of science as a whole. In Chapter II we could already see how the results of earlier research, in that case with respect to Rembrandt's grounds, were once more open to question.

It is for such reasons that the Rembrandt Research Project, in close collaboration with the researchers of the Dutch a1040chemical corporation DSM, have tackled the problem of the nature of Rembrandt's paint substance all over again.

[h2] A New Effort to 'Break the Code'

It was decided to approach the problem from various angles in a multidisciplinary project. In the first stage of the project, historical texts were collected and analyzed concerning the

production and processing of potential organic ingredients. Oil, after it had been pressed from linseeds, needed purification, bleaching, and sometimes thickening before it could be used.[8] In such processes the temporary introduction of other materials like bread crumbs, urine or even snow occured. Also certain dryers for speeding up the drying of the oil could have been added. Contemporary sources were searched for information on seventeenth-century technology and the availability of certain materials. Even if these sources do not relate directly to Rembrandt's specific methods and materials, they could provide an historically sound framework for our research. On the other hand, paint as a substance, its potential flow properties, and all other relevant rheological aspects had to be investigated and, if possible, correlated to the phenomena observed in Rembrandt's paintings. For this purpose a collection of photographic samples was built up. Discussions on how to describe the effects and the properties of the paint causing these effects sharpened the eye for the variations in Rembrandt's treatment of paint (see figs. 293-297).

The chemical analysis of paint samples still had high priority, as we believed that the search for other possible ingredients had to continue.

fig. 298Detail of the man's sleeve in the *Jewish Bride* (see fig. 173). The white paint, used to 'build' the impasto, in worn places shows through the yellow top layer

The conditions for collecting relevant paint samples were favourable. At the time this project started, the late Rembrandts from the Rijksmuseum were being restored, among which the Jewish Bride (see fig. 173) and the Syndics (see fig. 239), two paintings from that collection that are most representative of Rembrandt's late style and technique. One has the best possible access to the original paint layers at the time the old varnish layers have been taken off, and old retouchings and fillings have been removed. This is not to say that there is no risk of disturbing influences on the outcome of the analysis. All paintings are contaminated to some extent. Paintings on canvas have often suffered from numerous restoration treatments, during which – from the front as well as from the back of the painting – new organic materials may have intruded into the paint structure. Traces of these materials might affect, or rather confuse the results of chemical analysis of the original paint.

During the restorations mentioned above, sampling could take place under a1044ideal conditions. These samples had to be extremely small of course, and could not be taken in all parts of the painting. Some parts, such as faces and passages in pristine condition, are usually left untouched. Within these restrictions, however, it was possible to obtain some highly promising material. It was decided to concentrate first on two types of paint that are

significant for Rembrandt's style, the pastose whites and the red glazes. As to the first type: it was possible to obtain paint samples from the impasto of the sleeve of the man in the Jewish Bride, which is of white paint (which determines the impasto) covered with a thin yellow layer (fig. 298). Samples could also be taken of paint containing lead white in pentimenti in the Syndics, as in some other paintings where samples of the white were collected. Samples of the red glazes came from the woman's skirt in the Jewish Bride. The restorers working on the Syndics were intrigued by the paint which, as a result of its evident discolouration and disintegration, determines the greyish tone in the shaded area of the tablecloth in the Syndics (see fig. 239). They needed to understand the nature – and possibly the cause – of this disintegration. Samples were therefore taken in that area as well. It appeared that this paint contained a large amount of ground glass, probably the blue (but usually discoloured) pigment smalt, which was also used as a dryer (figs. 299, 300). On samples of this paint a binding medium analysis could be carried out as well.

fig. 299Detail of the table cloth in the Syndics (see fig. 239)

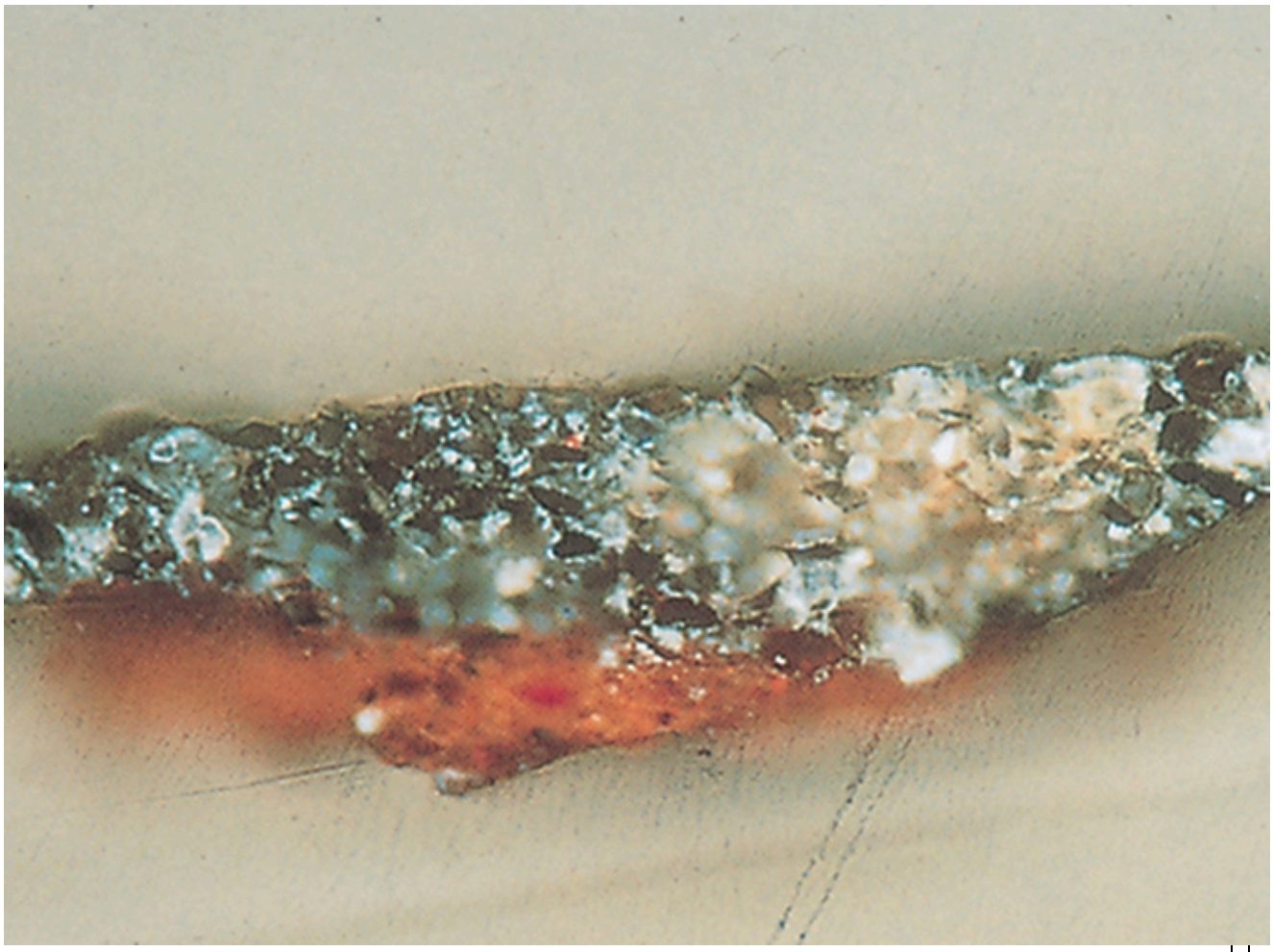

fig. 300Cross-section of the greyish paint in fig. 299, showing a thick layer of glass particles

Of these three types of materials (the lead white impasto, the red glazes and the paint containing smalt), the analysis of the paint with lead white seemed to be the most important one for understanding Rembrandt's style of painting, as this paint shows the greatest variation in surface texture and has also been mixed with other pigments in the light, usually pastose parts of the painting.

Karin Groen, who carried out this research in collaboration with specialists from DSM and other laboratories, identified more organic materials in these paint samples than the National Gallery's Scientific Department had found in its samples. Her research has been published in detail elsewhere.[9] Here, the results of this project will be discussed and interpreted while newly formulated questions of this 'work in progress' will be posed.

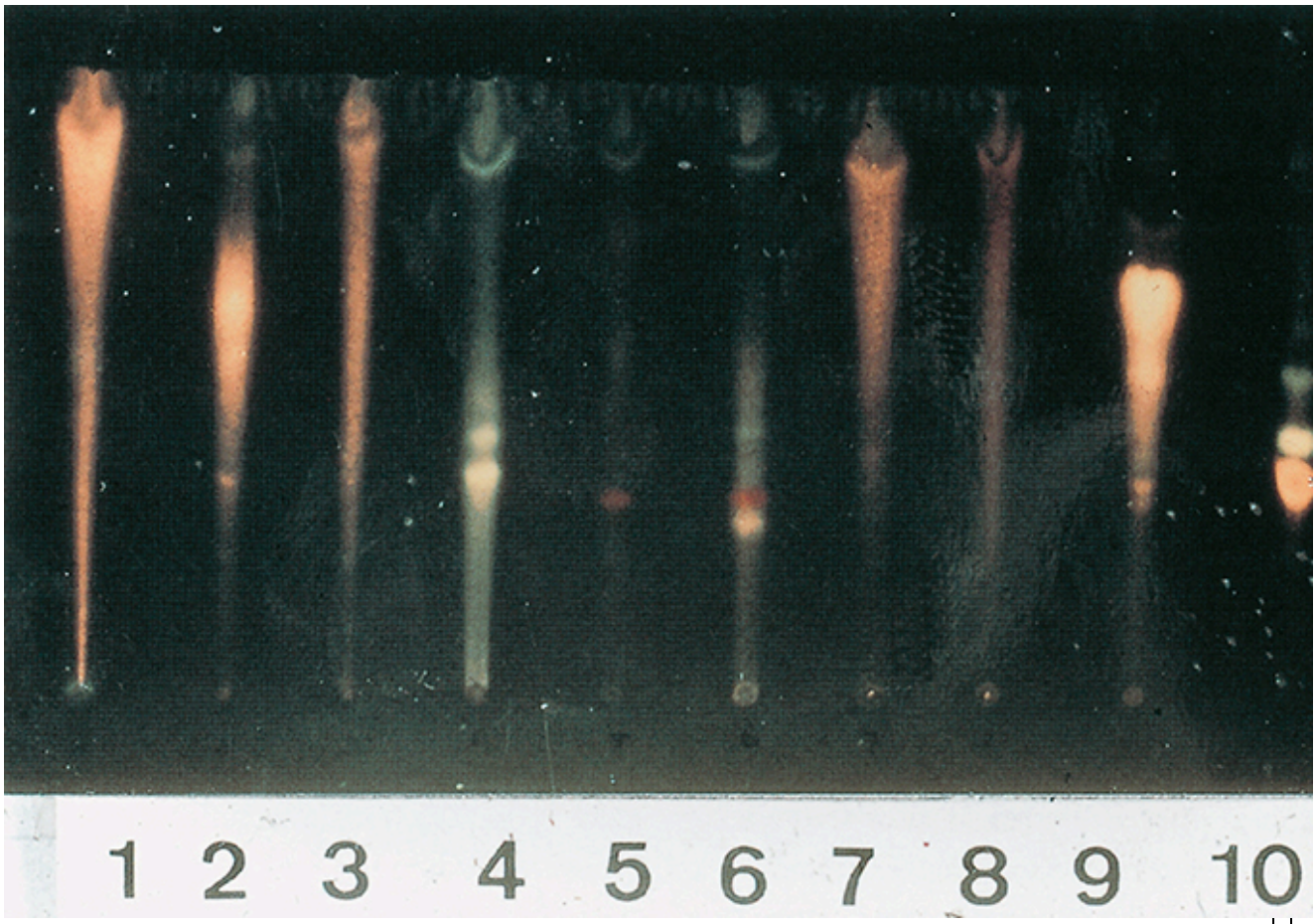

fig. 301Chromatographic division of constituents of organic red pigments (thin layer chromatography). Several reference samples, prepared in liquid form (1. cochineal, 2. kermes, 3. madder, 6. madder mixed with Brazil wood) move together with samples of red glazes nrs. 3, 7 and 8 (among which the red of the Jewish bride's skirt) along the glass plate covered with an absorbent layer. The pattern of stains of 1, 2, 3 and 7 are alike, which proves that Rembrandt used cochineal as a pigment for the red glazes investigated

[h2] Additions to Rembrandt's Paint

a1050Analytical chemistry marked a first breakthrough in our quest for Rembrandt's binding medium and opened new vistas on the field that Raymond White had been the first to explore thoroughly. There is no evading the need for an explanation of some of the methodical aspects of the chemical research involved here. It may be reassuring for the reader to know that the author is as much a layman in chemistry and analytical methods as most of his readers. His explanations will be no more complicated than his own understanding permits. They are, however, necessary to understand why there could be differences in the results obtained by the different scientists.

The tool used in the National Gallery for this particular research was a highly sensitive method for identifying molecules or fragments of molecules of organic materials: Gas Chromatography-Mass Spectrometry (gc-ms).[10]

The principle of chromatography was discovered long ago when it was observed that a liquid being transported along an absorbing substance, such as a plastered wall, leaves some of its components behind in different places as differently coloured stains (hence the word chromatography). This separation of the material into its constituents provides visual proof that the material is a mixture of different organic materials and permits the identification of some of these constituents.

The principle of chromatography can be applied in analytical chemistry in various ways, but there are always two phases, one the stationary (like the plastered wall) and one the mobile phase (the a1052moisture moving along the surface of the wall). The traditional analytical method, thin-layer chromatography, a simple separation technique, most resembles the wall with the slowly moving moisture (fig. 301). In gas chromatography the same principle is applied; the separated components – after they have been made gaseous – can be made 'visible' in a spectrum (fig. 302). Another application of the same principle is High Performance Liquid Chromatography (hplc), where the sample, prepared in liquid form, travels through a column of silica gel. Its constituents leave this column at specific intervals. All these methods have their own special sensitivity, which implies that certain materials are detected better with one method than with another. The choice of the method is a1053thus partly determined by one's hypothesis regarding the expected composition of the sample. Raymond White, in the comment on his findings, confirmed that he had found only oil in the paint samples. When he added that he had found 'no detectable additions of other materials' he may have thought of additions like resin or wax – the materials which, as we saw, were discussed in the past as possible additions to Rembrandt's paint. This may imply that he chose an analytical method that is best suited to identify oleous materials, wax, resin and related materials. Gas chromatography is an appropriate method to identify such constituents especially if it is linked to a mass spectrometer (MS).

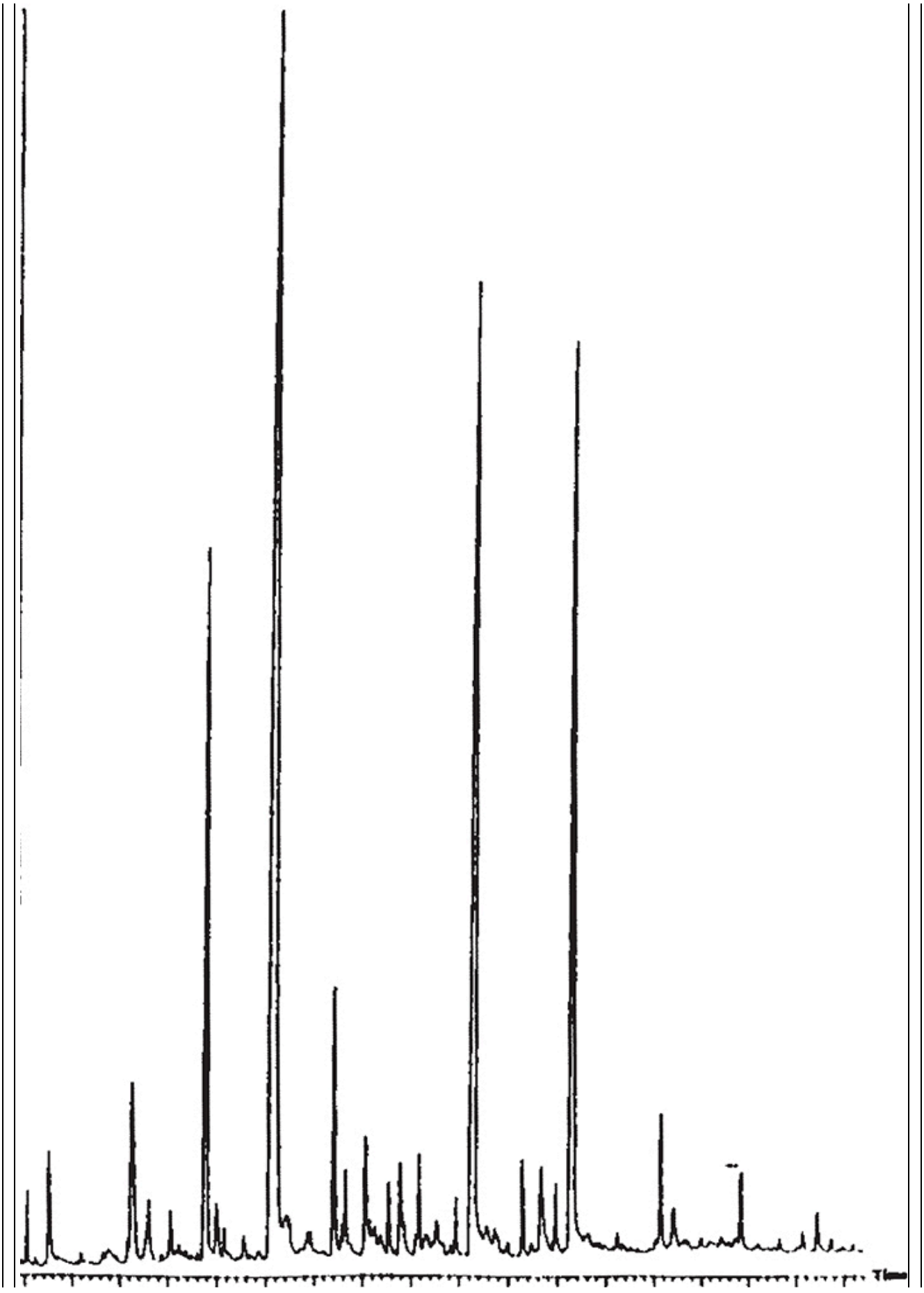

fig. 302Chromatogram obtained during the analysis of the binding medium of the white paint in the ruff of Margaretha de Geer (see fig. 289) with a Gas Chromatograph-Mass Spectrometer System (gc-ms). The four highest peaks of the spectrum indicate components of linseed oil. From left to right: Dimethyl suberate, Dimethyl azelate, Methyl palmitate, Methyl stearate)

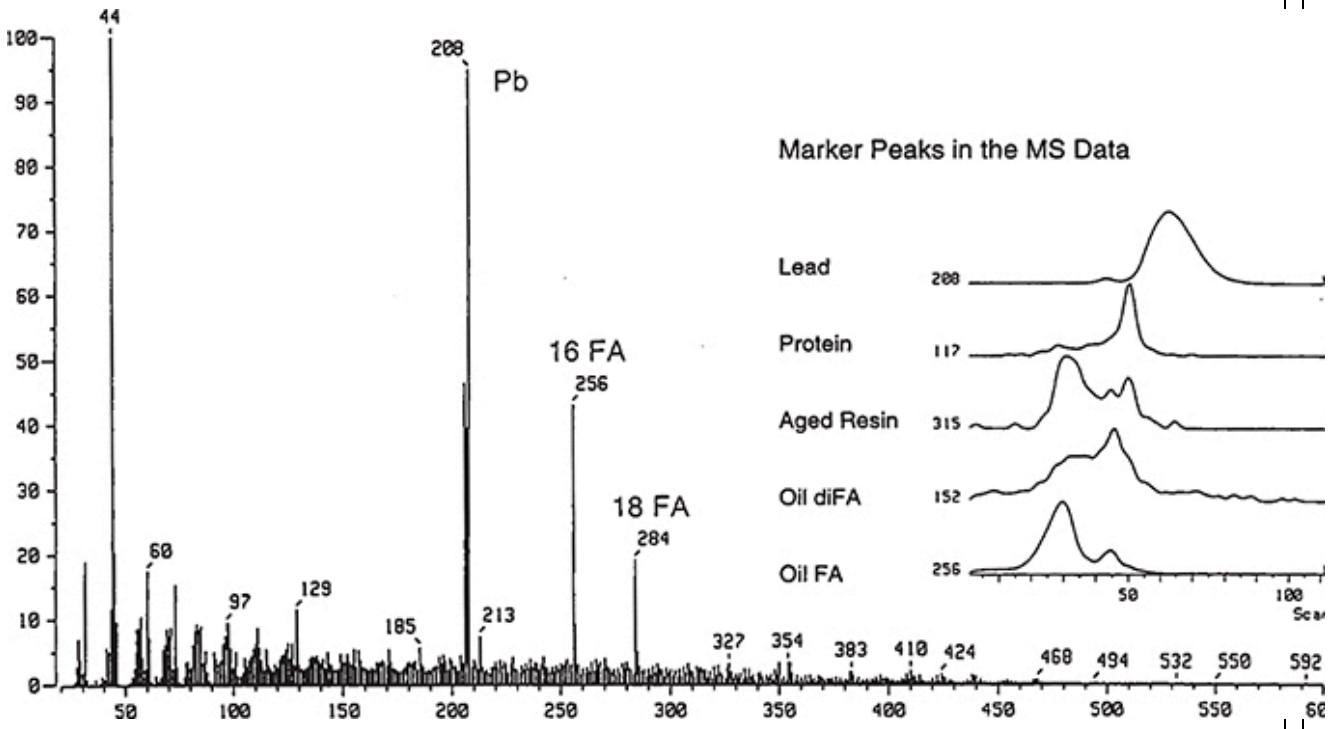

fig. 303Spectrum obtained with mass spectrometric analysis of the white impasto of the man's sleeve in the *Jewish Bride* (see fig. 298). The small protein peak, indicating the presence of egg, was only identified as significant after protein was found with hplc in another fragment of the same sample

The detection by a mass spectrometer of the molecular weight of the components is registered in a spectrum, which is a graphic delineation of the components depending on their mass. In such a spectrum, the presence and quantity of a specific component are expressed in the height of a peak (fig. 303). In principle, the mass spectrometer detects all organic components in a given compound. However, the usual result is a dense forest of smaller and greater peaks in the spectrum obtained. Consequently, such a spectrum is difficult to interpret. By linking a gas chromatograph to a mass spectrometer, as was done in the National Gallery (hence GC-MS), the components chosen for analysis in depth by the mass spectrometer are, as it were, pre-selected by the separating ability of the chromatograph before they are led into the mass spectrometer (see fig. 302). This pre-selection of the components adds to the precision of the analysis by mass spectrometry, but may also exclude certain constituents of the sample from the analysis.

It should be emphasized here that in the case of the analysis of paint samples the choice of analytical method is of the greatest importance. Using chromatographic techniques, one sacrifices the sample during the analysis, which thus cannot be subjected to complementary analytical methods. Although there usually is no more than one chance, in the case of the impasto of the man's sleeve in the Jewish Bride, there was enough sample material (though still very little) to carry out more than one analysis.

Another method for identifying organic components is Pyrolysis Mass Spectrometry, PY-MS. With this method the sample is placed into a small vacuum chamber and, if necessary, evaporated by pyrolysis, a way of decomposing an organic material by heat without burning it. (Pyrolysis is used, for instance, in a much cruder manner to produce charcoal or to crack petrol in refining works.) When some of the sample material taken from the white impasto of the Jewish Bride was analysed by Pyrolysis Mass Spectrometry in the fom Institute of Atomic and Molecular Physics (amolf) in Amsterdam, the outcome was almost identical with Raymond White's results: only cold-pressed, unheated linseed oil could be found.

However, when part of the same sample was analysed by High Performance Liquid Chromatography (hplc) – see above – at dsm Research, proteins suggesting egg were found. This result was not just an incident, as may happen in chemical analysis: it was confirmed several times when lead white paint samples of other paintings by a1056Rembrandt, like the Stockholm Claudius Civilis (Br. 482) were analyzed by the same method. Each time both oil and proteins were detected – oil, however, being the main constituent. This last point explains why the peaks indicating protein at first could not be spotted in the forest of the mass spectrometric peaks obtained in the amolf Laboratory (see fig. 303). In the spectra obtained in the National Gallery no egg could be detected, as the used gas chromatographic method is not sensitive to aqueous materials like proteins. And that is why egg was not discovered there. Other, indirect indicators for egg (yolk) could not be seen in those spectra as the amount of egg added to Rembrandt's paint appears to be relatively small.

Here ends this tedious but necessary excursion into the differences between some analytical techniques which played their part in this confusing quest.

The presence of egg in some form (egg yolk, egg white or all parts of the egg) in oil paint has considerable consequences for precisely the central issue of this chapter. Egg is basically an aqueous substance which, as everybody knows, is not soluble in oil; the oil will soon float on top of the watery substance. Using some mixing techniques, however, the water can be dispersed in the oil, resulting in an emulsion. In an emulsion either small drops of water are encapsulated in the oil (a fatty emulsion), or small drops of oil are encapsulated in the water (a lean emulsion). Mayonnaise is a well-known example of a lean emulsion. It is possible to produce mayonnaise by simply mixing egg yolk and oil, making sure the oil drops are dispersed slowly and evenly through the egg.

The small, encapsulated drops have to be stabilized against coalescence (the flowing together of dispersed drops) by an emulgator in order to force them to stay in their place. In this case the egg yolk or -white is the emulgator. It owes its emulgating quality to the phosphatides it contains. By mixing an oil/pigment mixture with egg yolk or the entire egg an emulsion can also be created quite easily. The water necessary to establish the emulsion need not derive from the egg only. Therefore only a little egg may have been required, simply to act as an emulgator. Most of the water may well have been already in the pigment. It was usual to keep the lead white pigment under water after it had been ground to the required fineness, the water being used to prevent the poisonous dust from being inhaled.[11]

The paste that results from the addition of water and egg to the paint has rheological properties that theoretically differ from a paint based on only oil and pigment (see fig. 301). The emulsion has more 'body', and the movement of the brush becomes easier, while the shape of the brushstroke is completely preserved after the brush has been lifted. The variation of textural effects to be obtained with such paint is greater than with the oil/pigment mixture.

One might think that the mystery of Rembrandt's binding medium has now been largely solved (although it may not explain all of Rembrandt's impasto effects). If the addition of egg to the paint was the clue to Rembrandt's procedure, there would be no further mystery

at all. Recent research into the use of binding media by Jan van Eyck, the legendary inventor – or rather modifier – of the technique of painting in oil, has shown that he also used an oil/egg emulsion in specific phases of the painting process[12], while our twentieth-century contemporary, the Dutch Expressionist Karel Appel, used the same method.[13] However, in another sense, it is possible that we have nevertheless hit here on a secret formula, as no seventeenth-century written source, as far as we know, has ever referred to the combination of oil paint and egg. It may have been one of these recipes that the painters time and again modified according to their own pictorial demands, and thus it may indeed have been considered a workshop secret in Rembrandt's time.a1060

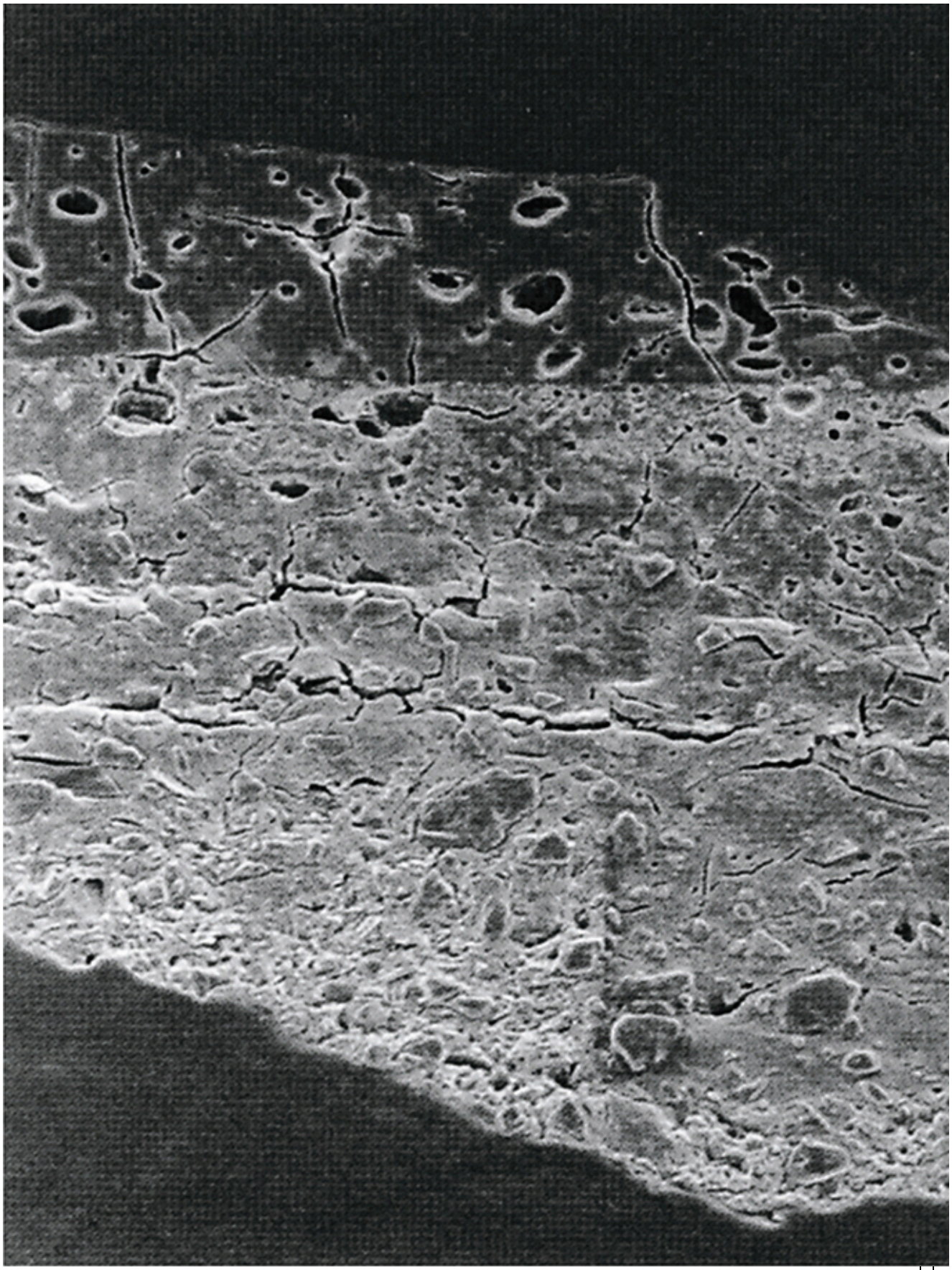

fig. 304Cross-section of the skirt of the *Jewish Bride* (see fig. 173) scanned with an electron microscope. The red glaze shows roughly spherical cavities which once contained water. This, together with the presence of gum, is a strong indication that this glaze was a fatty emulsion

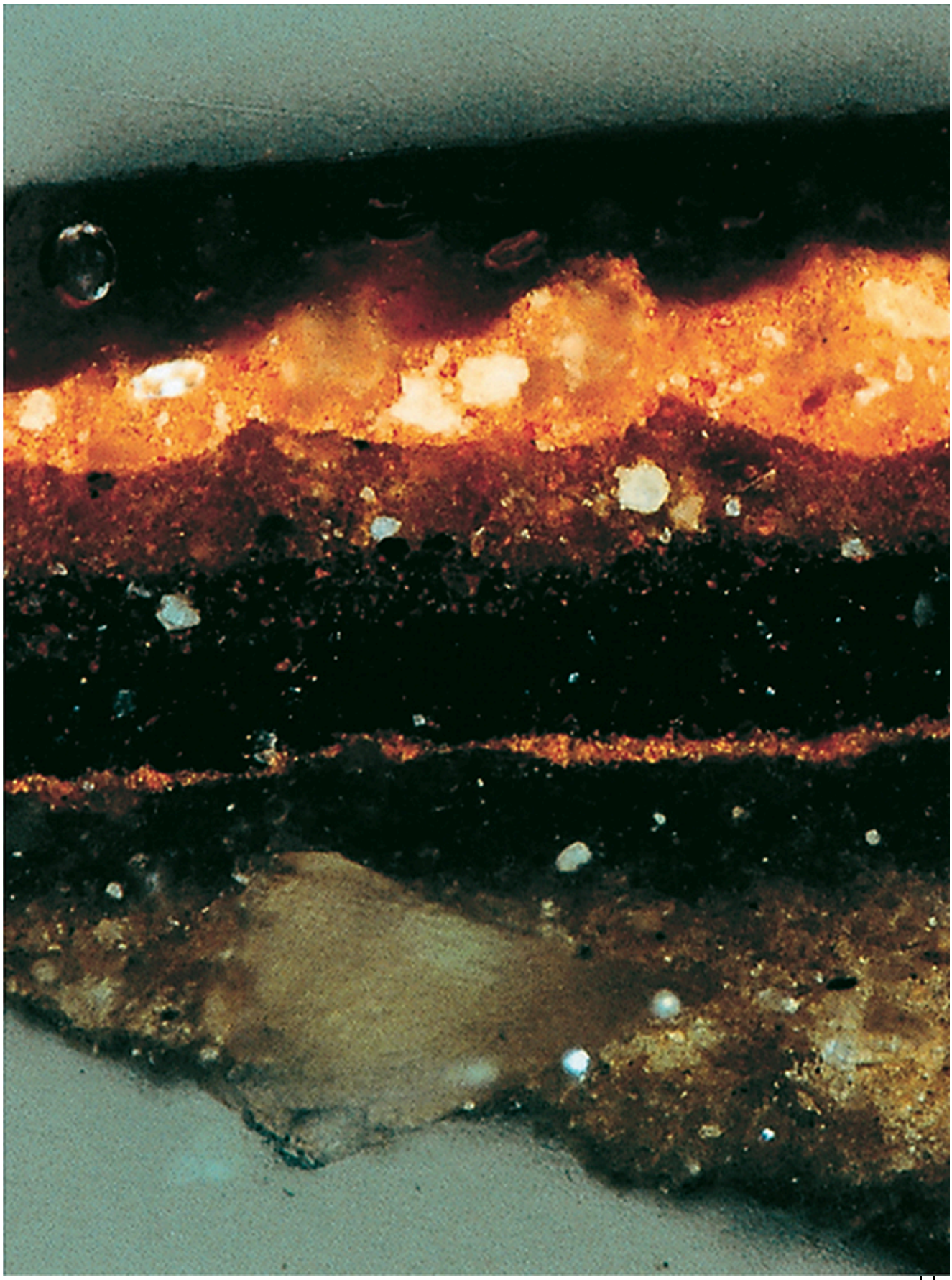

fig. 305Cross-section of the red skirt of the *Jewish Bride*. The top layer is the glaze (see fig. 304) applied on vermilion. The grey bottom layer is the ground (the curved lower contour following the shape of a thread from the linen fabric)

There are more questions to be solved in the matter of the use of lead white. Some of these will be discussed further on. At this point it is important to mention that the analysis of the red glazes of the skirt of the woman in the Jewish Bride yielded a surprise as well. Carmine (the extract of Mexican cocheneal – see fig. 301) was used as a pigment. Magnification of a paint cross-section of the red glaze up to about 1500 times revealed the presence of round and oval holes in the surface paint. These holes could not be the result of some later treatment of the paint as they were also found beneath the surface roughly as spheric cavities (fig. 304). Apparently a liquid had evaporated from these holes. With another technique to identify organic components, Fourier Transform Infrared Spectrometry (ftir) (a technique based on light absorption by certain chemical bonds in the compound), an unexpected addition to the red paint was found. The discovery of this component, specific for sugar or gum, confirmed that the red glaze in the Jewish Bride is an emulsion as well, this time of oil with a different aqueous substance than egg; the cavities in the paint must be a1063interpreted as the traces of the waterdrops emulgated in the oil. Seventeenth-century recipes mention cherry gum being used for making red ink.[14] No recipe for oil paint in which this ingredient is mentioned has been found as yet.

The question is why for this glaze – a transparent paint layer of basically even thickness – an emulsion was used rather than an oil/pigment mixture. Answering this question requires a different line of thinking than in the case of the lead white emulsion disussed above. Karin Groen has suggested that an emulsion was chosen here because of the considerable thickness the glaze obtained in this way. A thicker layer contains more pigment and thus results in a more saturated colour, given the fact that light travels through this layer, reflects on an underlayer, then travels again through the translucent layer and finally reaches the eye of the beholder. The saturation and strength of the colour increases with the thickness of the glaze.

It should be clear that the red glaze is not applied directly to the primed canvas but on an appropriate underlayer. In the case of the lit corner of the tablecloth in the Syndics, that underlayer is white – which accounts for the strong luminosity of that passage (see figs. 239, 242). With the skirt of the Jewish bride the dark red glaze was applied on vermilion, a bright orange-red which in its turn was applied over a first lay-in with shades of red and dark paint (fig. 305; see also figs. 173, 196). The bright vermilion together with the carmine glaze creates a rich red tone, from which the colour radiates, as it were, from under the paint surface.

Looking at White's table with the results of his analyses (see table A, page 230), it seems that his questions and expectations differed from ours. The table shows that he marked with precision the places where he took his samples, but that the choice of these places was not in the first place determined by the pigments or the pictorial aims or surface effects involved. It seems that in his conception the painting process was less 'compartmentalized' than it seems to have been, if we are right with our ideas on the use of the palette as discussed in ChapterVI. The idea developed in that chapter – that each passage of a painting, or even each stage in the build-up of a passage, may have required its own palette – could very well imply that the use of a binding medium may have varied accordingly. The results of the research dicussed here – for only two pigments up to this point – seem to confirm this idea.

The hypothesis of variation in the binding medium was supported further when the paint containing the glass or smalt particles mentioned above (see fig. 300) was found to contain components that indicate the presence of animal glue in the oil paint.

The presence of the additions found so far may be explained in different ways. In the light of the question dealt with in this chapter, one can imagine a deliberate choice guided by the wish to influence brushability, plasticity and surface structure of the paint. However, one should also allow for the possibility that the material was added in connection with the production process or the conservation of a1065a pigment or of a ready-made paint. Water for instance, was used – and still is used, by house painters – to isolate oil paint from the air, thus preventing drying (in fact polymerisation) of the paint. As mentioned above in the case of lead white, it could be that the presence of water determined the addition of other materials for other reasons than those which led to this research. Consequently, it will be necessary to study historic paint-technology in greater depth than has been done up till the present time when the use of binding media is being investigated.

The same applies to another factor which determines the properties of the paint as aspects discussed above, the rheological behaviour of paint. As indicated above, rheology is concerned with the 'flow' of plastic substances. It comprises the study of viscosity (i.e. the resistance of a liquid to flow), plasticity and other phenomena associated with the flow and deformation of liquids. In the case of paint, this includes properties like brushability, its tendency to maintain deformation, the way in which the paint spreads (or not), etc. Rheological research with Rembrandt's paint as reconstructed on the basis of the information found hitherto by analysis, may refine our research questions and trigger off new lines of research in altogether new directions.

An example of such a line in the investigation of Rembrandt's paint is the assumption that the rheological behaviour of his paint not only depends on the nature of the organic components discussed above, but also on variations in the particle size of the pigment used. Especially in the case of lead white produced in the seventeenth-century manner,[15] the wide variation in the particle size of the pigment may influence the rheological behaviour of the paint to a certain extent. As presentday pigments have a much more regular particle size, rheological models concerning paint with pigments with varying particle size have not yet been developed. This line of research has only been mapped out after the project as a whole was well under way. It demands a sub-project which may have considerable consequences for present-day paint technology.[16]

The nature of the unique impasto in the sleeve of the man in the Jewish Bride (see figs. 173, 191, 192) may require another approach. In this extremely heavy impasto no toolmarks are discernable; there are neither brushmarks nor tracks of the palette knife as they can be found for instance in the Braunschweig Family Portrait (fig. 209). It has been suggested that this effect in the Jewish Bride was obtained by applying fragments of the nearly dry skin of discarded white paint to the paint surface of the sleeve. Testing this hypothesis may require a specific kind of morphological study of that particular paint surface.[17]

Another phenomenon found on a much larger scale, thixotropy, deserves attention as well. Thixotropy is a rheological phenomenon that can be described as a reversible change from a set, gel-like condition of a plastic material to a more or less fluid condition under the influence of some mechanical force of, for instance, a brush. The gel-like condition is caused by the structuring of particles, be they solid or fluid, like the encapsulated drops in an emulsion, as long as they are present in large quantities. When this structure is a1069broken up by the application of relatively little force, like the movement of a brush, the gel is transformed into a fluid which almost immediately solidifies into a gel again once the brush is lifted. Thixotropic paint is very easily brushable while the brushmarks and other deformations are nonetheless preserved (see figs. 294, 297b). Depending on the speed with which these processes take place and the consistency of the gel, these brushmarks may

vary. In her book on ancient binding media, varnishes and adhesives, L. Masschelein-Kleiner, of the Institut Royal du Patrimoine Artistique, Brussels, suggested that

> *it is almost certain that the Old Masters, from Van Eyck to Rubens, had managed empirically to produce a thixotropic paint.*

She based this assumption on the observation that layers were superimposed 'à frais', without

> *the successive layers intermixing. Thus Rubens was able to paint 'La Kermesse' in twenty-four hours. Examination of the painting shows that the superimposed layers are distinctly separated, since the brush strokes are visible in the underlying layers.*

Masschelein-Kleiner added that

> *after Rubens, the composition of thixotropic paint seems to have been forgotten.*[18]

Whether this implies that in her opinion, Rembrandt, being a much younger contemporary of Rubens, did not know the secret of thixotropic paint is not clear. In present-day paint technology the phenomenon of thixotropy is still being exploited – it has obviously not been for-gotten. Moreover, the appearance of the surfaces of Rembrandt's paintings has led rheologists, confronted with these phenomena, to believe that Rembrandt exploited thixotropy as well. However, one gets the impression that in other passages the paint consistency may have been selected simply because it was far less easily manageable than thixotropic paint, thus producing another effect (see figs. 295, 297a). One could therefore ask the question whether some of the variations in Rembrandt's paint consistency and surface texture might be caused by the conscious manipulation of the degree of thixotropy.

Such insights cannot be obtained by paint analyses with methods such as those mentioned above. Nor can they be 'read' with any objectivity from the surface of Rembrandt's paintings, as Eastlake and others tried to do. It will be necessary to reconstruct paint according to the 'recipes' which are slowly emerging from the analysis of paint samples.

In such reconstructions, many variables should be applied. Comparison of well-preserved passages in the paintings with these reconstructions may provide clues to resolve the old questions surrounding Rembrandt's paint. Only if this were not to succeed would there be reason to start thinking again of Rembrandt as an alchemist.

[h1] X The Impact of Time and Rembrandt's Ideas on Colour and Tone

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Ernst van de Wetering

fig. 306Rembrandt, Self-Portrait as Zeuxis, c. 1663. Canvas, 82.5 x 65 cm (detail). Cologne, Wallraf-Richartz-Museum. The painting is covered with layers of yellowed and probably tinted varnish

a1073

[h2] The Yellowed Varnish and the Different Aging of Paint

No other artist has been associated so much with a 'golden tone' as Rembrandt. (figs. 306, 309) Is it any wonder then that controversies have raged especially over this painter in the past, when that familiar image came under pressure after layers of yellow varnish were removed and the colours in his paintings turned out to be cooler than expected?[1]

The image of the 'golden' Rembrandt is so strong that one inevitably has to ask whether the painter intended this 'patina' himself, or even whether he may have coated his paintings with a tinted varnish intentionally.

It is not easy to find out if Rembrandt applied a tinted varnish onto his paintings himself. In the past, the layers of varnish on all of the paintings had been removed several times, usually quite heavy-handedly. The eighteenth-century restorer Jan van Dijk (d. in 1791), whom we know to have cleaned the Night Watch (fig. 245) in 1751, wailed over

...the great many old Jewels of Art, ruined by bunglers' hands, not to say incapable claws, which have been overcleaned in such a way that the panels show through the lit part as well as through the dark parts, some examples of which are still to be found in the Doelen...[2]

Also the Night Watch, which hung in the Doelen until 1715, had previously been handled that roughly (see fig. 255).[3] However, it is precisely on this painting that a trace of the first layer of varnish has been preserved. It was found in a paint sample taken from the shield bearing the a1078names of the schutters portrayed by Rembrandt. Underneath that shield, which was added by a later seventeenth-century hand, there is a thin layer of varnish (figs. 307, 308). To the extent that this layer could be examined in a paint crosssection, no traces of additions have been detected. Since quite a lot of pigment is necessary to tint a varnish in such a way that the tint actually affects the tone and colour of a painting, we might expect such additions to be visible in the paint sample. Therefore, the first layer of varnish – which very likely had been applied by Rembrandt himself – must have been completely clear.

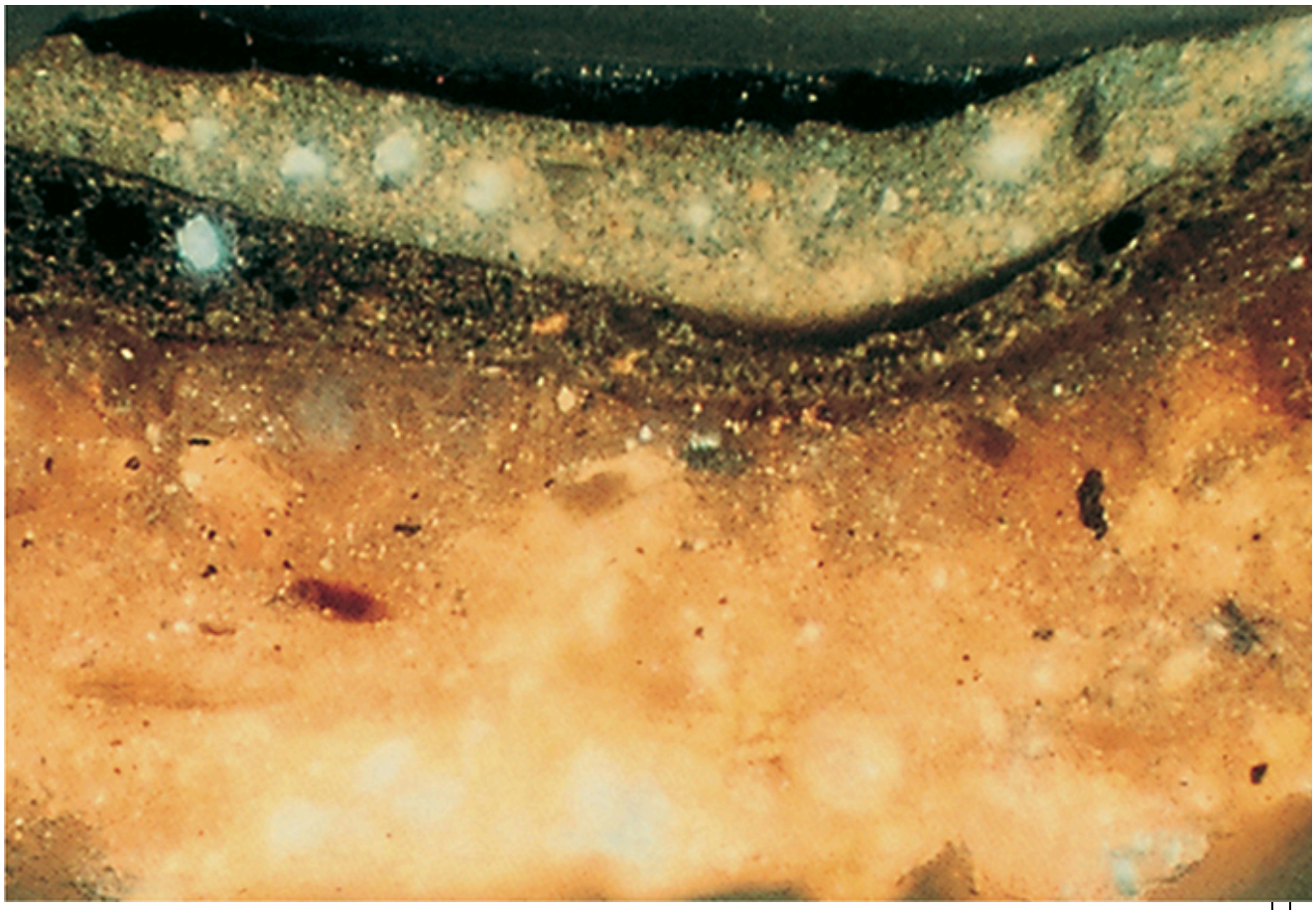

fig. 307Cross-section of shield with names of the schutters added by a later hand in the Night Watch (see fig. 245)

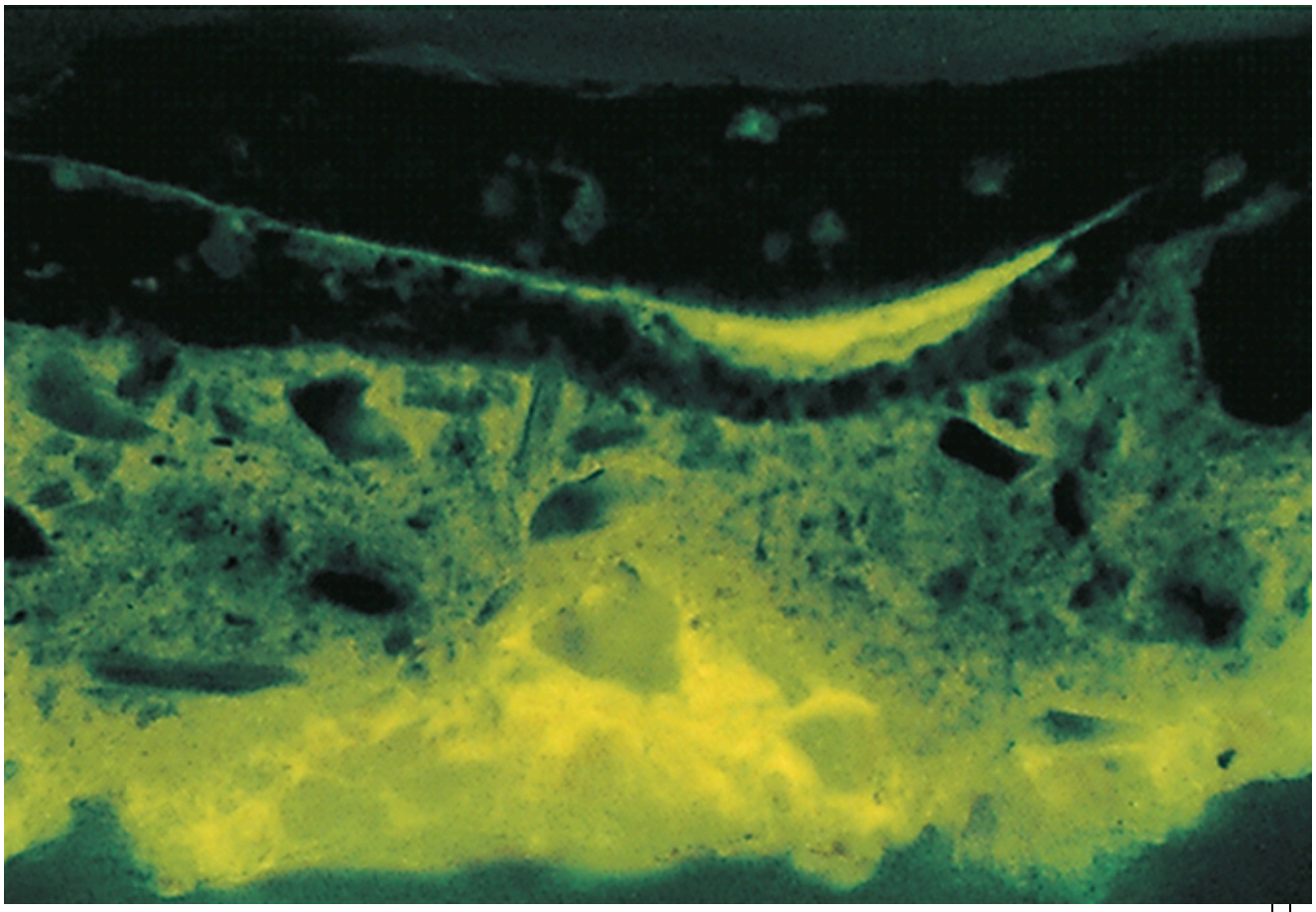

fig. 308Ultraviolet radiation of the cross-section shown in fig. 307 reveals a layer of varnish between the paint of the Night Watch and the paint of the added shield. The varnish layer shows up as a greenish band

There are other good reasons why it is not very probable that Rembrandt intended to cover his paintings with a coloured varnish. Anyone who takes the trouble to analyze some of Rembrandt's recently cleaned paintings[4] will see that he took pains to achieve extremely subtle tonal and colour gradations in certain passages of his work; consider, for example, the deliberate gradations between warm and cool hues in the flesh colours in faces. Such gradations would largely be lost under a layer of yellow varnish; the warm tones would lose their warmth, the cool tones would become less cool, the overall result would lose its subtlety (compare figs. 309, 310). The answer to the question whether Rembrandt deliberately preferred to have his paintings covered with a tinted varnish must therefore in all likelihood be no.

The next question is whether Rembrandt took into account that and how his paintings might change in the course of time. Painters were aware of the fact that paintings would change with time, due to the ageing of the materials.[5] Could Rembrandt have taken such changes into consideration?

Images of 'Father Time', who came into painting galleries at night with a soft brush and finished the paintings (an image used by the English essayist Addison [1672-1719]),[6] were not yet prevalent in Rembrandt's days (fig. 311). This positive attitude towards the ageing of works of art became only possible at the end of the seventeenth and in the early eighteenth century, when the historicity of earlier art was sensed more consciously. In 1678,

Rembrandt's pupil Samuel van Hoogstraten would still describe a copyist who copied the traces of ageing of a painting, as a ludicrous impostor:

I could hardly keep a straight face when a copyist who has a good reputation showed a1084*me his art, which consisted in imitating the smuttiness, mould and rot when copying old, somewhat decayed paintings, even more faithfully than the parts that were still intact. He who tries to deceive the ignorant by such an imitation of antiquity, deceives himself.* [7]

Changing attitudes to the patina were the result of an intensified experience of the irreversible break with the past, while before that time, past and present seem to have been experienced much more as a continuum.[8] One may safely assume that Rembrandt must have wanted his paintings to look – and continue to look – exactly the same as they came from his easel. His choice of painting materials and his presumed ideas about tonal and colouristic matters, as discussed further on, confirm this.

One argument against the removal of old varnish, often heard in cleaning controversies, concerns the possibility that painters may have continued to work on their paintings after these had already been varnished. When old varnish layers were removed by later restorers, those paint layers on top of the varnish could then have been regarded as not autograph, and therefore removable, overpaintings by other hands.

Certainly in Rembrandt's case, the possibility that he continued to work on top of his own varnish layer is not just theoretical. In more than a few cases Rembrandt must have resumed work on his paintings after a longer or shorter period. Of some paintings it can be assumed, on the basis of X-ray examinations, that he started to work on them again even several years after the painting had been finished (figs. 312, 313).[9] In most cases such paintings could not be sampled to determine whether those later additions were painted on a layer of varnish, but they probably were. In the one case where samples could be taken, a layer of varnish was in fact found under, what seem to be, autograph additions. That was in The Concord of the State in Rotterdam (see fig. 26).[10] This painting, like almost all Rembrandts, went through some very drastic cleanings in the past, but the paint applied on top of the varnish, and the hidden layer of varnish itself, have survived those treatments well.

According to a persistent myth, discussed in Chapter VIII, Rembrandt may have used varnish or other resinous substances as a binding medium. If that were true, the cleaning of his paintings would be dangerous as the solvent used to soften the varnish could also affect the paint layer underneath. Chemical analysis has proven the myth of Rembrandt's resinous binding medium to be mistaken (see Chapter IX).a1089

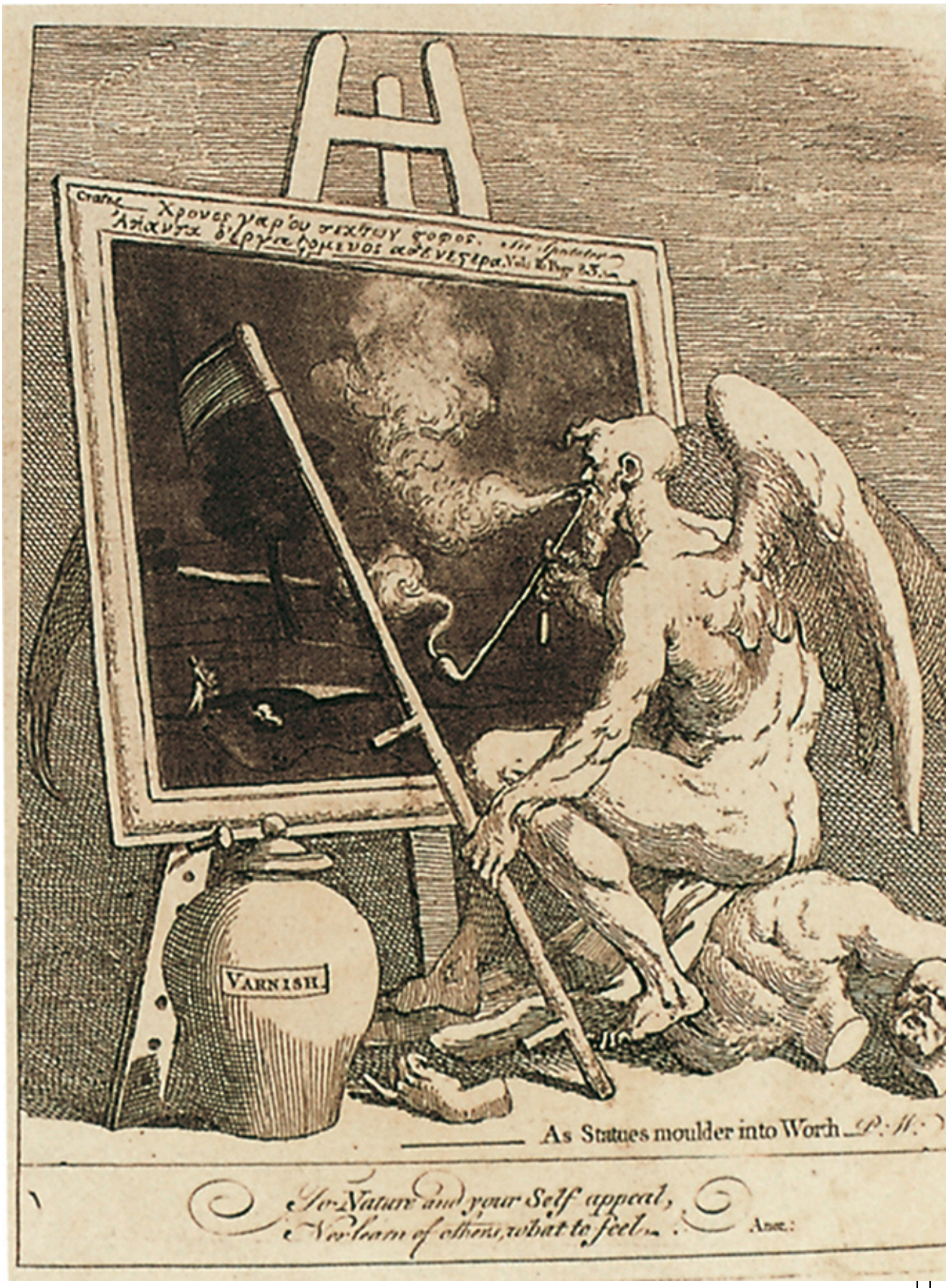
VARNISH
As Statues moulder into Worth P: W:
To Nature and your Self appeal,
Nor learn of others, what to feel.
Anec:

fig. 311William Hogarth, Time Smoking a Picture, 1752. Etching. This print ridicules the appreciation, widespread in the eighteenth century, for paintings with a yellowed varnish and other traces of ageing

fig. 309Rembrandt, Portrait of Nicolaas van Bambeek, 1641. Canvas, 108.8 x 83.3 cm. Brussels, Koninklijk Museum voor Schone Kunsten

fig. 310Rembrandt, Portrait of Agatha Bas, 1641. Canvas, 104 x 82 cm. Buckingham Palace, London. Figs. 310 and 309 reproduce companion pieces, the one cleaned, the other covered with yellowed and possibly tinted varnish

a1093

fig. 312Rembrandt, Susanna and the Elders, 1647. Panel, 76.6 x 92.8 cm. Berlin, Gemäldegalerie. Rembrandt started this work c. 1637 and finished it in 1647

a1095

On the basis of the above, and leaving aside the discussions on the possible dangers of the use of certain solvents for the physical condition of the paint,[11] we may argue that apparently no decisive arguments can be advanced against the removal of yellowed varnish from Rembrandt's paintings.

The key question must still be tackled however: after the yellowed varnish has been removed, do the paintings look the way Rembrandt intended? The fact is that paint can age in different ways, depending on the choice of pigments and binding media. Some sections may become darker, a1097others lighter, and still others may discolour (for example, green can turn blue, or red turn brown). The ageing of the different sections in the painting can

seriously distort the image originally intended by the artist, to say nothing of the effect of the heavy-handed treatments Jan van Dijk complained about in the above quote. For some important museums like the Hermitage and the Louvre, that has been a reason not to remove the yellowed varnish entirely (see fig. 320). In their philosophy, such a yellow veil binds the sections that may have grown apart, and in fact helps to create a new unity.[12]

The question whether cleaned Rembrandts still look like what the painter once intended may be answered if we discover what Rembrandt's intentions were. Texts throwing light on some of his pictorial intentions have been discussed in previous chapters, especially in Chapters VI and VII. The crucial question here is whether it is possible to gain insight into those intentions that are relevant to the questions dealt with in this chapter.

[h2] Rembrandt's Intentions with Colour and Tone

There are some seventeenth-century texts, including one by Rembrandt himself, which provide us with a direct view of Rembrandt's intentions regarding the aspects of colour and tone, those properties of the painting most affected by yellowing varnish and changes through time. As will be clear, any local distortions of tone or colour may especially affect the spatial and compositional structure of a painting.

fig. 313Attributed to Barent Fabritius, drawing made before 1647. Budapest, Szepmuveszeti Museum. Copy after the Berlin painting (see fig. 312) in an intermediate stage. The faithfulness of the copy can be judged from comparable features in the X-ray and the paint relief of the painting

We know that such drawings were made by apprentices to practice the rendering of light and space. The drawing can therefore be considered to faithfully reflect the tonal values of the prototype in its original appearance.

The painting is now covered with a heavy, yellowed varnish. One can nonetheless conclude that the far background must have darkened considerably.

The contemporary texts providing insight in Rembrandt's intentions in these matters are: a sentence from a letter written by Rembrandt himself; two passages from the book by Rembrandt's pupil Samuel van Hoogstraten (fig. 244); and a passage from a book by the German painter Joachim von Sandrart (for some years Rembrandt's fellow townsman; fig. 315).

In a letter written to Constantijn Huygens in 1639, Rembrandt touches on the way a painting should preferably be hung. Rembrandt wrote,

My lord, hang this piece in a strong light and where one can stand at a distance, so it will sparkle at its best.[13]

One may cautiously assume that by 'sparkle' ('voncken') Rembrandt meant that under strong lighting the luminosity of certain passages in his painting would be shown to their best advantage and that this was evidently his intention. The fact that Rembrandt may have intended for a1102such passages literally to 'sparkle' could be inferred from the fact, already dealt with on page 175, that he deliberately applied impasto precisely to the light sections. The light bounces off the irregularities of the paint surface of that particular passage, the reflected rays reaching the eye of the beholder, so that the painting literally sparkles. The passage in the letter to Huygens suggests that Rembrandt wanted the light areas in his paintings to have an extremely strong effect (which, in fact, is only possible if the painting is treated with a thin, clear and light-reflecting layer of varnish).[14]

The second text is a passage from the in this book so often-quoted Inleydinge in de Hooge Schoole der Schilderkonst by Rembrandt's pupil Samuel van Hoogstraten.[15] This text offers insight into the manner in which Rembrandt and the painters of his circle thought about the nature of the relationship between light and dark in a painting. It is necessary to place Hoogstraten's text first in a somewhat broader context. For his considerations, Hoogstraten made extensive use of the book De Pictura Veterum, published in 1637 by Franciscus Junius (1591-1677), which in 1638 appeared in English under the title The Painting of the Ancients, and in 1641 in Dutch. In the text under discussion here, Hoogstraten refers to Junius' account of how the Greeks and Romans already considered the effect of light in a painting to depend on the degree to which the dark parts were handled.[16] Hoogstraten continues that Junius, in his comments on these ancient texts, disapproves of the harsh contrast between light and dark, and adds imaginatively that such paintings 'are like chessboards'. He continues, 'Moreover, he [Junius] wants painters to use the power of shadows moderately.' [17] Whatever Junius may have meant exactly, Hoogstraten's interpretation of that sentence is not that the shadow effect itself should be moderate, but that the frequency of alternation between light and shadow should be limited. That is apparent from the continuation of his considerations:

I therefore recommend you not to mix up lights and shadows too much, but to combine them properly in groups; let your strong lights be gently accompanied by lesser lights, and I assure you that they will shine all the more beautifully; let your deepest darks be surrounded

by lighter darks, so that they will make the power of the light stand out all the more powerfully.

Then Hoogstraten adds, this way illustrating Rembrandt's intentions specifically:

Rembrandt developed this virtue to a high degree, and he was a master in properly combining related colours.[18]

In the Dutch text, Hoogstraten characterizes the 'related colours' in fact as colours that are 'friends' ('bevriend'). Hoogstraten's text implies that as a rule the highest lights were placed by Rembrandt in a light surrounding, whereas the darkest tones are flanked by less dark tones. Because of this binding of the dark portions of the compositions on the one hand and the light portions on the other, it appears that the viewer is enabled to grasp the light-dark structure of the composition at a glance as the number of contrasts in a painting is limited drastically this way (figs. 187, 314). In developing this approach, the painters of the Baroque a1108apparently based themselves on psychological insights obtained through empirical observation. When 'reading' a painting with too many contrasting passages, the eye feels compelled to explore all those contrasts one by one. The image which the viewer constructs this way is therefore additive in nature, while with Rembrandt the synthesis of the image takes place immediately, at a glance, so to speak.[19] In another passage of his book where Hoogstraten deals specifically with the composition of the Night Watch (see fig. 245), he elaborates on this compositional device:

The proper masters accomplish that their entire painting is 'eenwezich' [a unity, in the sense that it subordinates everything to one compositional 'grasp'] [...] Rembrant observed this requirement very well in his piece in the 'Doele' in Amsterdam [the Night Watch], but in the opinion of many he went too far, making more work of the image as a whole as he preferred it ['het groote beelt zijner verkiezing'] than of the individual portraits he was commissioned to paint. But this work, however much it may be reproved, will survive all its rivals because it is so painterly in conception ['schilderagtig van gedachten'] and so lively in its spatial arrangement ['zwierich van sprong'], and so powerful that – in the opinion of some people compared to it all the other paintings [in the Doelen hall], are like playing cards. Although I would have preferred if he had put more light into it.[20]

I quote this extremely rich passage in full, although only the first sentences apply to the subject of the 'related colours' discussed here. The last sentence will be of great importance further on, however. Hoogstraten's remarks on unity ('eenwezich') and the image as a whole ('het grote beelt') underline the importance of this compositional device in which 'related colours' are united in a few clusters (with a deliberate limitation of the number of strong contrasts).

The question here is what can be learned from all this as to Rembrandt's ideas on the colouristic and tonal aspects of his painting – and more in particular, whether these features have survived the influences of time on his paintings. It is striking that Rembrandt avoided complete merging of the light and dark sections in the passages with the 'related colours' by using small variations in colour, tone or surface structure, particularly when indicating forms placed next to or in front of each other. Compare, for instance, the subtle shifts from yellowish and pinkish tones to light blues and greys in the recessing elements in the Blinding of Samson of 1636 (fig. 314). It is this handling of subtle differences that Hoogstraten must have meant when he spoke of the 'properly combining of related ["bevriende"] colours' in a compositional unity. It is evident that a yellowed varnish can allow these 'related colours' to blend to such an extent that they merge into a more or less even tone. On the other hand, the notion of the 'related colours' sharpens the eye of the present-day beholder for certain pictorial effects in Rembrandt's paintings. Works like those reproduced in figs. 187 and 314

testify to the fact that Rembrandt's paint (and his pictorial intention) in such passages at first sight do not seem to be substantially affected by uneven ageing.a1111

fig. 314Rembrandt, The Blinding of Samson, 1636 (Detail, see fig. 158). Frankfurt, Städelsches Kunstinstitut

The last seventeenth-century text concerning Rembrandt's ideas about the a1113use of colour and tone has shortly been mentioned on page 150, where I dealt with the

complications of a pictorial 'management' that grew from working with 'one palette per passage'. It concerns the concept of 'houding', discussed in that context already.

The passage relevant for the issue discussed here is found in the book on architecture, sculpture and painting, the Academie der Bau-, Bild- und MahlereyKünste, written by Rembrandt's contemporary, the German painter Joachim von Sandrart (1606-1680) (fig. 315). His book contains a wealth of information about Dutch painters of the seventeenth century, knowledge which Sandrart to a large extent had first-hand, because he had met many Dutch painters in Rome and twice spent long periods in the Netherlands, first in Utrecht, where he served his apprenticeship, and later in Amsterdam, where he lived for several years in flight from the horrors of the Thirty Years' War. Very quickly, Sandrart acquired a good position as a painter in Amsterdam, and directly or indirectly, must have been quite familiar with what went on in Rembrandt's studio. Sandrart's account of Rembrandt is rather critical, because his artistic norms, as with his other critics, like Hoogstraten en De Lairesse, were coloured by classicist art theory by the time they wrote their books.[21] In one respect, however, Sandrart was full of praise. This is demonstrated by a passage in which he deals with the necessity 'to break the colours' in such a way that all the components of the picture are given their correct place in the pictorial space. According to Sandrart, the result of this method is what 'we call Hauding [sic] in Dutch'. Sandrart goes on:

fig. 315Print by Philipp Kilian after a painting by Joh. Ulrich Mayr, Portrait of Joachim von Sandrart, 1679 (detail of the frontispiece of the Teutsche Academie)

This is something the painter must be very clearly conscious of, yet few recognize it. And here we can learn from our marvellous Bamboccio [Pieter van Laar] as well as from others, especially from the very diligent and, on this point, extremely brilliant Rembrandt: he has practically worked miracles [...], and has consistently achieved true Harmony with all the colours, without exception, in accordance with the rules of light...[22]

Not until recently did we know what Sandrart may have meant exactly by the term 'Hauding'. As discussed on pages 149-150 this term turns up in other texts from the second half of the seventeenth century as well, specifically in treatises on the art of painting by Goeree, Hoogstraten and De Lairesse.[23]

Of course, perspective was an important means of suggesting space. But the painters of that period, and apparently a1118especially Rembrandt, realized more and more clearly that other, much more subtle means could create the suggestion of space even better. Therefore, when the authors mentioned above, elaborate on the painterly means of creating space by 'houding', they do not mention perspective in that context (see Goeree's definition of 'houding' quoted on p. 150). It is tempting to see the huge perspectival error in The Syndics (see fig. 239) – having the right edge of the table rise instead of slope down a1119– as a demonstration of Rembrandt's indifference towards perspective, rather than as an error. For Rembrandt – as nearly all of his works demonstrate – 'houding' was clearly a much more effective means of suggesting space than perspective.

fig. 316Rembrandt, Rembrandt's Mother as the Profetess Hannah, 1631. Panel, 60 x 48 cm. Amsterdam, Rijksmuseum. The red mantle the woman is wearing has been partly

discoloured from red to brownish red (see p. 259) The light rims along the folds are an indication that velvet was depicted. Red glazes on these rims may have been worn off

fig. 317Rembrandt, The Baptism of the Eunuch (detail, see fig. 29; see p. 259)

Those elements described by the authors mentioned above as a means to achieving a successful 'houding' related specifically to the gradations in colours and tones, and how these were used relative to each other. When trying to solve the dilemma with regard to the cleaning of Rembrandt's paintings it is clear that the fact that 'houding' was of prominent importance to Rembrandt is of extra significance. If in Sandrart's eyes the gradations in 'broken colours' and tone meant as much, as Hoogstraten's quote about 'related' colours already indicated, the removal of yellowed varnish is of great importance as regards the possibility to evaluate Rembrandt's artistic intentions and to experience those intentions as viewers. The question therefore has to be asked once more whether those very subtle relationships in tone and colour might have been disturbed due to possibly uneven ageing of the separate sections. If so, the retainment of a layer of yellow varnish for veiling the distortions would be preferable after all.

[h2] The Ageing of Pigments

To gain some insight into the possibility that distortions in the colouristic and tonal relations may have occurred, one would have to check which pigments, theoretically, could have changed. Rembrandt appears to have used very few pigments with a tendency to change. The pigments found in his paintings are: lead white (with or without the addition of chalk); yellow ochre, lead tin yellow, 'schijtgeel' (an organic yellow); red ochre, vermilion and different red lakes (organic dye stuffs prepared as pigments); smalt and azurite; various brown earth pigments; bone black and charcoal black.

As we know, earth pigments are all stable in colour and tone. The same is true of lead white (as long as it has not become transparent by saponification) and lead tin yellow, that exquisite pale lemon-yellow that plays such a significant part in some of Rembrandt's highlights. The red ochres, too, are basically colourfast, and the same holds true for the other red pigment, vermilion; so is azurite, the blue or greenish blue pigment from a mineral source.

fig. 318Rembrandt, Landscape, c. 1640. Panel, 52 x 72 cm. Braunschweig, Herzog Anton Ulrich- Museum

a1124A number of pigments were not stable. It is certain that Rembrandt used smalt – a ground-up blue glass which tends to turn grey. It is this property of smalt which contributed to the change in colour and tone in the shaded part of the tablecloth in The Syndics (see fig. 239), which has probably turned from dark purple into a greyish tint. In a few instances a sky meant to be blue may have become grey, such as the sky of the Utrecht Baptism of the Eunuch, dating from 1626 (see fig 29). But these are exceptions; in view of Rembrandt's choice of subjects and the nature of his treatment of light, blue skies are rare in his oeuvre and Rembrandt used blue only sporadically. In many cases he must have used stable blues (see for instance fig. 183). When he wanted to achieve bluish greys he mixed lead white with ground charcoal, which gives a splendid – and very stable – bluish tint.

Then there are some organic pigments that may have lost their colour. Rembrandt made use of 'schijtgeel' (an organic yellow), which fades easily. It has been a1125found only sporadically in paint samples. Some organic red pigments tend to discolour. The cloak of The Prophetess Anna in the Rijksmuseum, for instance, probably was initially deep red which has turned into brownish red (fig. 316). This seems to be more the exception than the rule, though. Red lakes were, as dicussed on p. 240, usually applied on an opaque red underpainting containing red ochre or vermilion, so that the colour would not change significantly if the red glaze were to fade (see fig. 305). But the red lakes that Rembrandt commonly used – for instance, in Banning Cocq's sash in the Night Watch (see figs. 257,

255), or in the woman's robe in the Jewish Bride (see fig. 188), or the illuminated portion of the tablecloth in The Syndics (see fig. 242) – seem to have largely retained their powerful colour. In one of his earliest works, the aforementioned Baptism of the Eunuch, the red glazes are still quite intact as well (fig. 317).

fig. 319Rembrandt, The Three Trees, 1643. Etching, 21 x 27.9 cm

fig. 320Rembrandt, Woman near a Stove, 1658. Etching, 22.1 x 18.2

a1128

fig. 321Rembrandt, Bathseba, 1654. Canvas, 142 x 142 cm. Paris, Louvre

a1130Consequently, the chances of drastic discolouration of the pigments in Rembrandt's paintings are theoretically restricted. When we analyze the pictorial effect in his paintings as they have come to us in the light of the concepts discussed above, it can be said that the light passages 'sparkle' and that the 'related' colours – in particular in the lighter zones – are arranged in such a 'houding' that colour-istically, spacially and compositionally, Rembrandt's paintings (unless the paint surfaces have been damaged very seriously or overpainted) still seem to be basically intact.

[h2] The Darkening of Paint and the Etchings as Touchstones

Another question which is much harder to answer, however, is whether and to what degree the sections containing a substantial amount of oil may have darkened. Only when we know that can we tell to what extent the 'houding' Rembrandt aimed at has been preserved.

Darkening is largely the result of the fact that certain kinds of paint – mainly those with dark pigments – contain more binding medium than lead white does and mixtures containing lead white do. Paint containing much binding medium tends to darken (figs. 321a & b).

Since oil paint has the tendency to become slightly more translucent (see p. 194), theoretically the darkening could be compensated for somewhat by the tint of the ground showing through increasingly. On the other hand, when the ground is impregnated and consequently darkened by a wax/resin mixture during past lining operations, as in the case of the Night Watch, this may contribute to a substantial darkening of the thinnest and most translucent (usually the darker) passages, which are optically influenced by the underlayer. If we compare the Night Watch with the copy made by Gerrit Lundens (see figs. 257, 258) – which is painted on panel and on a luminous ground – it seems that some parts, like the lit floor, have been seriously affected, while in many other parts the gradations in the dark tints have blended together more and the overall darkness in the shaded parts has increased. The above quoted comment by Hoogstraten that he 'would have preferred if Rembrandt had put more light into' his group portrait (see page 253) is, however evidence that large portions of the Night Watch must have been shrouded in shadows from the outset (Hoogstraten saw it in 1643, very soon after it was finished or even earlier).

In case one suspects that originally there were more details to be seen in the dark sections of Rembrandt's paintings, which afterwards may have become obscured due to darkening, Rembrandt's etchings offer an extraordinarily valuable proving ground. It is certain that Rembrandt worked his etching plates in such a way that the dark sections of the prints were actually intended to be dark in very close gradations. In looking for relevant material for comparison of Rembrandt's etchings, it is important to realize that Rembrandt only used a full range of tones in a limited number of his etchings. Most of them show a linear setup, using loose hatchings to suggest light and shade.

a1132In some uncompleted etchings the difference between this 'graphic' approach and the subsequent 'tonal' approach can easily be observed (see figs. 45, 46). In the tonally developed passages the full range, from the deepest blacks to the brightest lights, was reached. Quantitatively speaking, the dark zones take up substantial portions of the entire composition. Details and tonal modulations are subdued and skillfully integrated into those dark passages by the use of related ('bevriende') tones.

fig. 321aRembrandt, The blinding of Samson, 1636. Canvas, 205 x 272 cm. Frankfurt am Main, Städelsches Kunstinstitut und Städtische Galerie

Comparison of Rembrandt's paintings with tonally fully developed etchings (figs. 318, 319; 320, 321) suggests that as a rule the relationships between the tones in the dark sections of his paintings have been relatively well preserved, though on the whole these sections may have darkened somewhat and lost some of their detail. The overall relationships between light and dark as a rule are so well preserved that one is allowed to say that Rembrandt's intentions in this respect were not essentially distorted by 'time'.

fig. 321bUnknown pupil of Rembrandt, drawing after The blinding of Samson, Frankfurt am Main, Städelsches Kunstinstitut

Such drawings after Rembrandt's paintings were made by his pupils with the aim of learning to transpose colours into tones. It was important to practice creating the impression of space by the right choice of such tonal values (see 'Houding' in the Glossary). For that reason these drawings are important sources for the understanding of the original appearance of Rembrandt's paintings. They demonstrate that these paintings originally showed more detail in the dark areas (see also figs. 312 and 313).

From this, as well as from the other considerations mentioned here, we may conclude that in our time a painting by Rembrandt, as long as it has not been impaired by heavy overcleaning or overpainting – or by severely yellowed layers of varnish – can safely be enjoyed as mirroring Rembrandt's original artistic intentions.a1135

[h1] XI Perspectives on the Quality of Rembrandt's Art

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Ernst van de Wetering

geteekent door Rembrant van Rijn naer sijn selver
soon Et hij in sijn schilderkamer geklevet was.

fig. 322Pupil of Rembrandt (Willem Drost?), Self-Portrait, c. 1652. Drawing in reed pen and washes, 20,3 x 13,4 cm. Amsterdam, Museum het Rembrandthuis. The inscription is a seventeenthcentury addition stating that Rembrandt was wearing these clothes while working in his studio

a1138 a1139

[h2] Rembrandt, the Famous Painter

In the winter of 1667 an imposing train of coaches and horsemen travelled slowly from town to town through Europe. Its arrival in the Netherlands was a topic of much discussion. There is mention of enormous tips bestowed on helpful ferrymen and their crews, and hospitable innkeepers, their cooks and many others paid by the cashier of the company.[1]

Although the most prominent person in this company officially travelled incognito, everybody knew his identity. It was the future Archduke of Tuscany, Prince Cosimo, the later Cosimo III (1642-1723) (fig. 323).[2] He was a descendent of Lorenzo de Medici, il Magnifico, the benefactor of Michelangelo. For this chapter it is important to know that during his stay in Holland Prince Cosimo de Medici visited Rembrandt.

As this book began with the account of a much earlier visit to Rembrandt – the visit of the notary Jacob van Swieten and his two witnesses in 1632, when Rembrandt was only just settling down in Amsterdam (see p. 1, 2) – it seems appropriate to end with Cosimo's visit to the old Rembrandt. It is not necessary to prove once again that Rembrandt really existed – he certainly did – but the few words devoted to that visit which have survived in a document in Florence may serve as an inspiration to look back on the foregoing ten chapters and assess the relevance of these chapters for our understanding of Rembrandt.

Several of the courtiers from Cosimo's retinue kept journals which eventually a1143were assembled into the official logbook of the journey as it has been preserved in a Florentine archive and which provides a remarkably rich picture of Holland seen through the eyes of a group of foreign visitors. From this journal it appears that the four-month voyage mainly had the character of a sightseeing tour. In fact it closely resembled what was later called the `grand tour' every well-educated young man in Europe was expected to make in those days. Cosimo was 25 years old at that time.

Among the sites worth visiting were painters' studios. Visits to at least 15 different Dutch painters were recorded in the journal, while several other painters presented themselves offering to show (and sell) their work.

Cosimo's train of coaches arrived in Amsterdam on 19th December, 1667 and he and his company stayed there until 7th January, 1668. On the morning of 29th December – (the journal relates that the canals were frozen and there were skaters on the ice) – the prince paid a short visit to Rembrandt, together with his agent in Holland, Francesco Ferroni, and their guide Mr. Pieter Blaeuw (son of the famous cartographer).

The walk to the Rozengracht (fig. 324), the canal where Rembrandt had been living since 1660, surely must not have gone unnoticed. Cosimo's logbook frequently mentions the curious crowd which usually followed (and sometimes bothered) the prince and his company.

We will never know if the three men, after they knocked on Rembrandt's door, had the opportunity to enter Rembrandt's house, let alone his studio. The logbook tells us that of the painters visited that morning (Rembrandt was not the only one), none had finished work to show. Therefore, in order to see their paintings, the three men went to the houses of people who owned work by the painters called on that morning. According to the journal, `His Highness was received there with the utmost obligingness'.[3]

fig. 323Justus Suttermans, Portrait of the future Archduke Cosimo III de'Medici, c. 1667. Florence, Palazzo Pitti.

At noontime they were home again. Cosimo's visit to Rembrandt must have been very short indeed. This time we are not even given a chance to hear Rembrandt speak, as we were during the notary's visit.

But we are certain of one thing that was in the minds of Cosimo and the two other men while they waited for the door to open: for them Rembrandt was, as the journal states, 'Reinbrent, pittore famoso' ('Rembrandt, the famous painter').[4]

For many readers who grew up with a1147the myth that by the end of his life Rembrandt was poor and forgotten this may come as a surprise. On 29th December, 1667 Rembrandt not only existed in the flesh, but apparently also in the minds of many people. He was famous. Rembrandt was the first name that came to many people's minds when painting was the subject. This clearly emerges from surviving statements on Rembrandt, for instance a passage in another journal, this time of an Englishman. This traveller, Peter Mundy, visited Holland in 1640, more than 25 years before Cosimo, and he wrote on that occasion:

> *As for the art off Painting and the affection off the people [the Dutchmen] to Pictures, I thincke none other goe beeyond them, there having bin in this Country Many excellent Men in thatt Faculty, some att Presentt, as Rimbrantt ettc* [5]

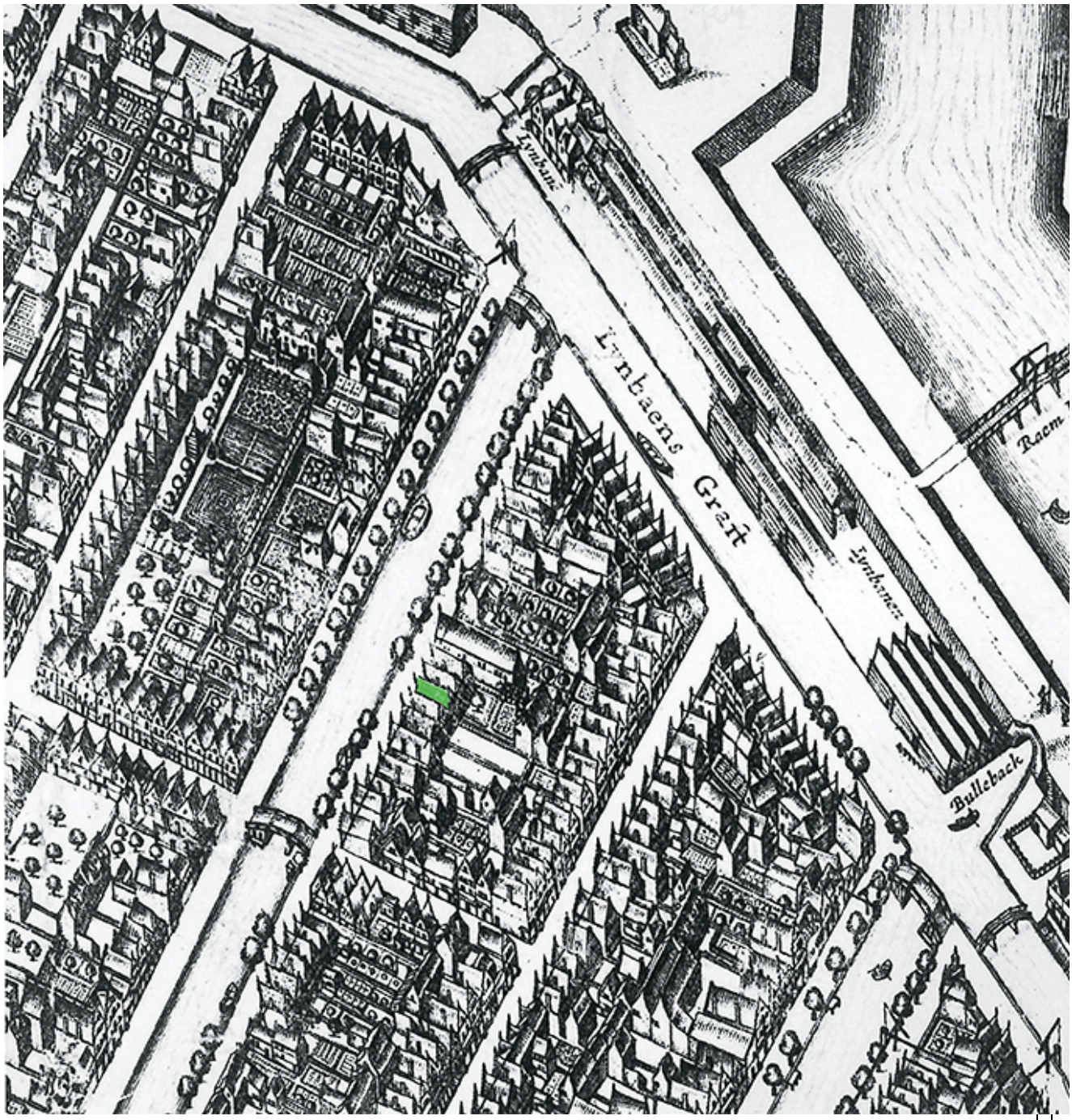

fig. 324Detail from the map of Amsterdam by Balthasar Florisz, 1635. The house marked in green is the one were Rembrandt lived from c. 1658 until his death

That Rembrandt was not forgotten in his old age is confirmed by a recently discovered document: about two years before a1150Cosimo's visit, a German art lover, Gabriël Bucelinus (1599-1681), when making a list of – as the title says – 'The most distinguished European painters', wrote behind Rembrandt's name, 'nostrae aetatis miraculum' (the miracle of our age). It was the only one of the 166 names listed which had a remark of that kind added.[6]

But such a laudatory remark is not particularly explicit as to the causes of that admiration. The same holds true for many other seventeenth-century remarks on Rembrandt that have been preserved. The poet Lambert Bos, for instance, included in 1650 the following tempting lines in a poem in praise of a collection of paintings:

I will not attempt your fame,
O Rembrandt, with my pen to scrawl
For the esteem you receive in every hall
Is known when I merely mention your name.[7]

If Rembrandt was already something of a legend during his life, the question arises what the content of this legend was. In other words: in what terms would Cosimo and his contemporaries characterize Rembrandt when they were discussing him? And, does this book touch on any of the aspects that intrigued Rembrandt's admiring contemporaries?

[h2] Contemporary Praise

There are a number of documents which are more explicit than those of Lambert Bos and Bucelinus. Most of these, though, were written soon after Rembrandt's death. They were, however, mostly written by people who had known Rembrandt well, either directly or indirectly. The last account on Rembrandt that can be considered a direct source is based on accounts of Rembrandt's pupils; this is the biography of Rembrandt by Arnold Houbraken (see fig. 4), often quoted in this book, that was published almost 50 years after Rembrandt's death.

When surveying these texts it appears that from early on the narrative qualities of Rembrandt's work were praised. In about 1630, Constantijn Huygens, in his brilliant analysis of the figure of Judas in Rembrandt's Judas Repentant (see fig. 103), argues that Rembrandt had surpassed the painters from Antiquity as well as the great sixteenth-century Italian artists when it came to the representation of emotions expressed by figures that act in a history painting.[8] In 1641 Philip Angel praised Rembrandt's faithfulness to the details of the setting in which the scenes he depicted took place.[9] When, between 1669 and 1678, the art-loving Amsterdam doctor Jan Sysmus organized his knowledge on art in a notebook, he listed Rembrandt along with none other than Raphael and Rubens as the three greatest narrators of biblical stories.[10] We can be sure that a great deal of Rembrandt's ambition as an artist manifested itself in the field of the narrative. Most of the remarks in seventeenth-century testimonies and comments, however, deal with Rembrandt's qualities and pecularities on pictorial issues. Indeed, the present volume seems to touch on an essential part of what determined his contemporaries' admiration (as well as their puzzlement).

Some of these more explicit remarks on Rembrandt as an artist show a striking a1157ambivalence that would continue to dominate the Rembrandt literature for a long time. As Slive expressed it: 'For more than two centuries a tremendous "but" figures in the writings on Rembrandt.'[11] This started immediately after Rembrandt's death. From around 1670 it was common to criticize Rembrandt severely for his adherence to naturalism, his choice to render ugly nudes, and especially for ignoring the so-called 'rules of art'. As Joachim Sandrart formulated it:

He [Rembrandt] did not shun to oppose our rules of art like Anatomy and the rules of proportion, like perspective and the use of Rafael's drawing and to oppose a systematic

training [of young artists] and the Academies which are so important for our profession and to contradict these, arguing that one should hold only to Nature and to no other rules.[12]

For a long time this criticism was interpreted to indicate that Rembrandt – in accordance with the nineteenth-century cult of genius – was misunderstood and ahead of his time. But then this phenomenon was put into its proper context. Seymour Slive and others have pointed out that this criticism should be seen in the context of the rise of classicism, which in the 1670s had almost completely usurped the art scene. Jan Emmens placed the 'but' in the right context when he stated:

the criticism leveled against Rembrandt by writers of the 1670's makes it clear that he [Rembrandt] was still the towering figure of an older, and now old-fashioned generation of Dutch painters. That is why the blows of the classicistic attack, which could have been just as well delivered to any other painter of his generation, all fell on his head.[13]

Slive's 'tremendous' but implies that the critique of Rembrandt also contained praise. It always did. My hypothesis is that the words of praise embedded in the classicist attacks are 'windows' on those aspects of Rembrandt's art that were most admired during his life and constituted an important part of his fame.

For a first example one may turn to the much quoted poem from 1681 by Andries Pels on the proper and improper use of theatre. In that poem Pels allows himself a lengthy excursion into the field of painting by taking Rembrandt as an example of an artist who did not obey the (classicist) rules of art. Andries Pels blamed Rembrandt for having become 'the foremost heretic in the art of painting'. He suggested that Rembrandt in this way tried to avoid being compared to Michelangelo, Raphael, Titian and Van Dyck (see also p. 169). Rembrandt, according to Pels, haughtily chose to err; but Pels hastened to add that Rembrandt

was not the lesser of one of these artists in houding, nor did he yield in the power of his colouring. (For 'houding', see p. 150 and 255.)[14]

These lines would imply that apparently purely pictorial aspects were considered to be Rembrandt's most praiseworthy qualities. This is confirmed by the fact that Samuel van Hoogstraten (see fig. 244) and Joachim Sandrart (see fig. 315) also gave their highest praise to Rembrandt for his command of 'houding' (and for the compositional and spacial qualities involved), and for his outstanding use of colour (see p. 252-257).

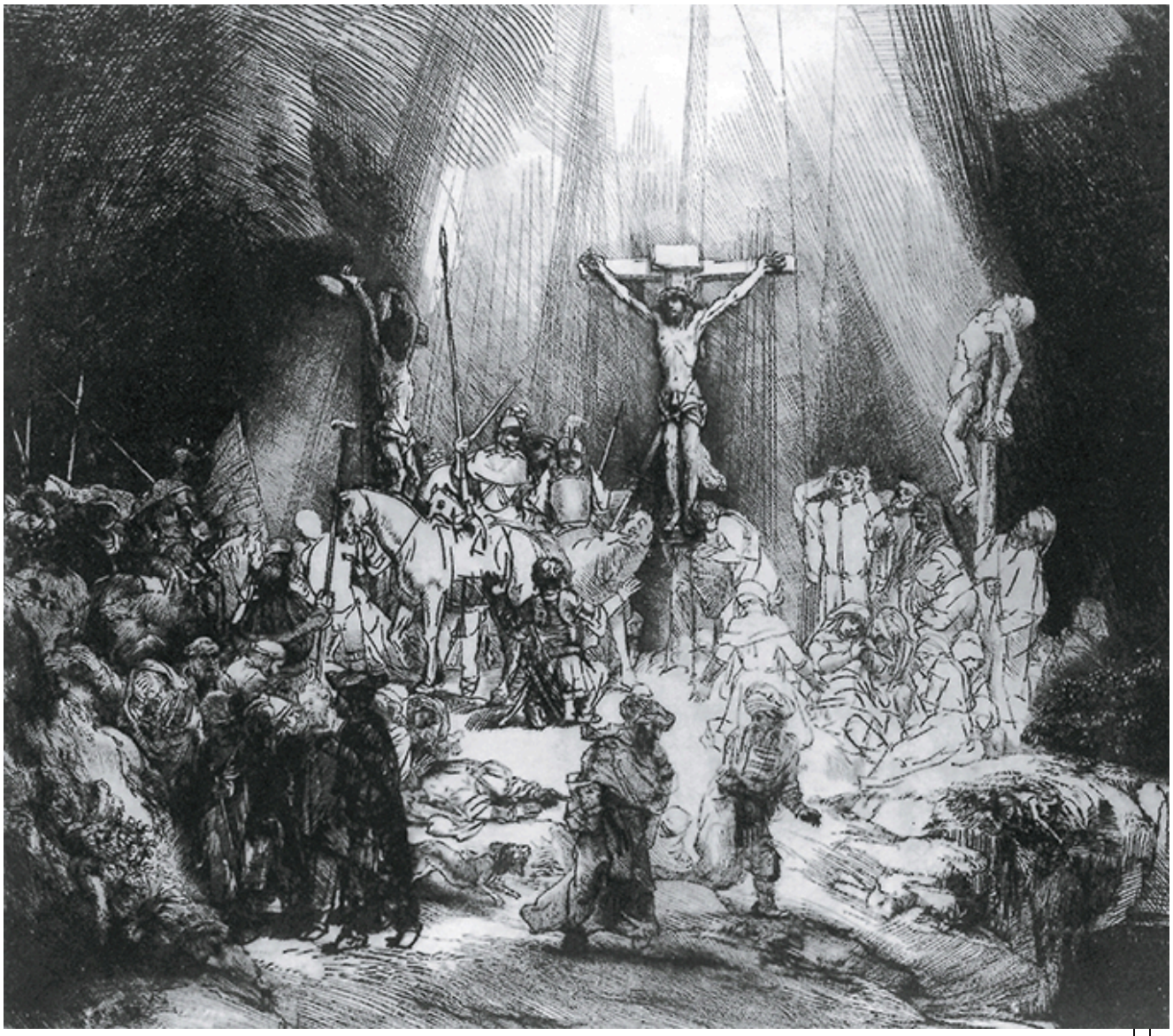

fig. 325Rembrandt, *The Three Crosses*, etching, third state (1653).

Elsewhere I have argued that Gabriël Bucelinus, the art lover just mentioned, a1163who in 1664 praised Rembrandt as 'the miracle of our age', may well have been inspired to this accolade by both Sandrart and Hoogstraten, whom he both met in the 1650s. That was well before classicism had become as normative as it would be by 1670, when both painters wrote their books on the art of painting (in 1675 and 1678 respectively).[15] They formulated their critical remarks in retrospect. But their words of praise may well be a repetition of opinions they had held much earlier. The painter Gerard de Lairesse, in his Groot Schilderboeck, is quite honest about the shift in his esteem for Rembrandt. The reader may remember that De Lairesse had himself portrayed by Rembrandt in 1665 (see fig. 189). About 30 years later he wrote:

> *I do not want to deny that once I had a special preference for his manner; but at that time I had hardly begun to understand the infallible rules of art.*[16]

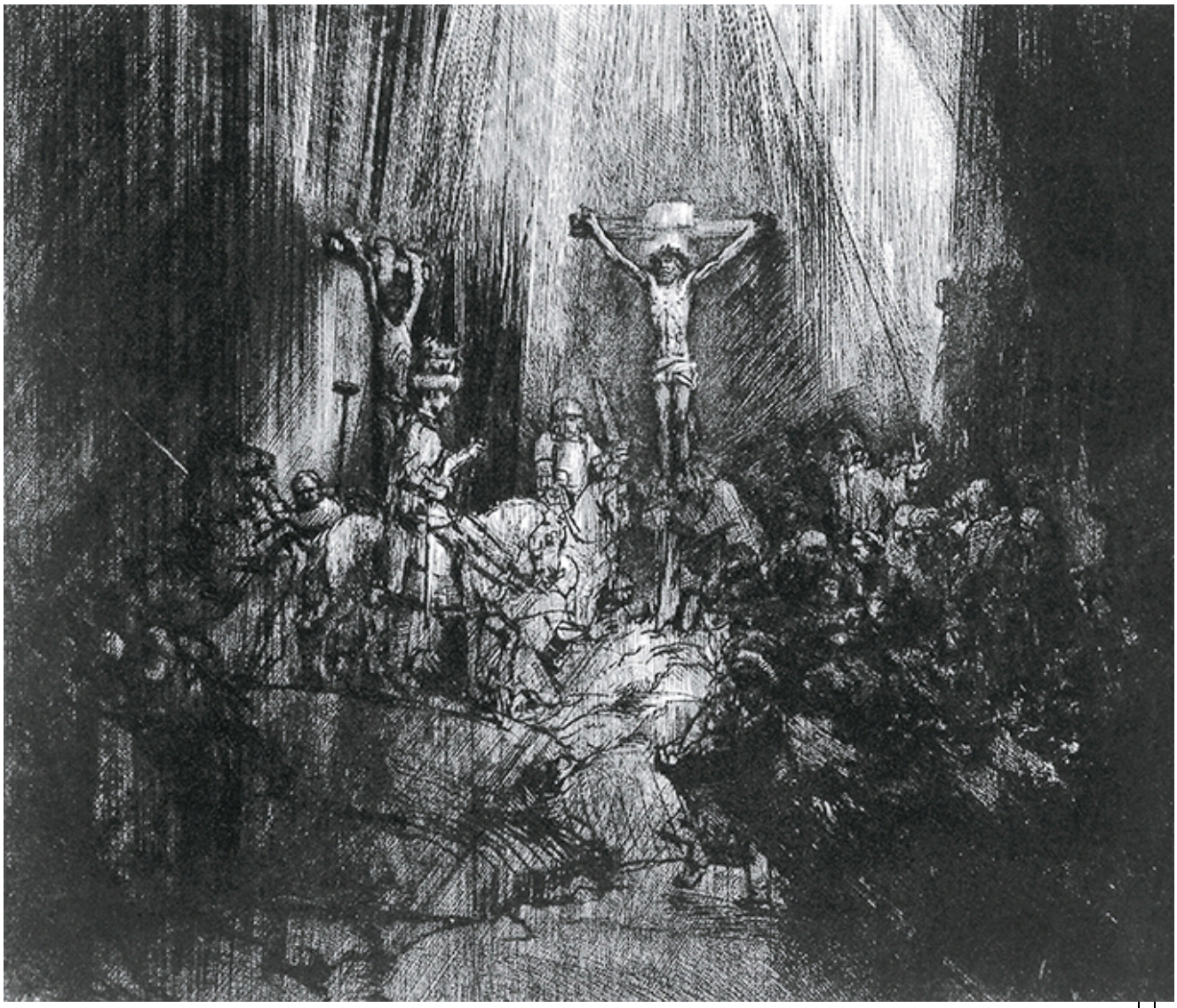

fig. 326Rembrandt, *The Three Crosses*, etching, fourth state (c. 1661).

a1167

The 'window' Lairesse opens on the qualities of Rembrandt as he saw them before he discovered the 'infallible rules of art' shows Rembrandt again as a painter more than anything else. Lairesse's praise for Rembrandt no doubt reflects the reasons for his initial admiration:

> *[...] everything that art and the brush can achieve was possible for him, and he was the greatest painter of the time and is still unsurpassed. For, they say, was there ever a painter* a1168 *who by means of colour came as close to nature by his beautiful light, lovely harmony, and unique, unusual thoughts [as to the narrative?] and so forth?*

But high praise of purely pictorial qualities by fellow artists is usually not enough to make an artist legendary during his lifetime. There must have been other aspects that stirred the imagination of the audience. That this was the case is demonstrated by another category of

contemporary statements on Rembrandt: those on his unusual – if not bizarre – approach to painting and etching.

[h2] The Craftsman and the Artist

We tend to think that the now common idea of the artist as an outsider stems from the nineteenth century, when the image of the 'crazy', unadaptable artist, the 'bohemian', became almost standard. But such ideas already existed in the sixteenth century. In 1604 Karel van Mander noted 'Hoe schilder hoe wilder', (The more they paint the more untamed). Van Mander added that even in his time this was already a well-known saying.[17] In an anonymous pamphlet from 1662, in which the position is taken that people ought to dress more in accordance with their social status, the author acknowledges that he is at a loss as to painters, 'so seer verscheyden sijn dese luyden, ende oock veel dol van geest' (these fellows are so different [in social status] and many are also crazy).[18]

One might say that as early as Rembrandt's time, there was, next to a willingness to admire, a latent readiness to be shocked, puzzled or amused by the unusual behaviour of the artist. In the case of Rembrandt, his technique – especially his late technique – was cause for such wonderment. His style of etching was described by Baldinucci as 'una bizzarrimissima maniere' (a most bizarre manner) (figs. 325, 326).[19] As for his manner of painting, in Chapters I, VII and VIII, we came across a variety of statements dealing with Rembrandt's sometimes excessive impasto, and his whimsicality as to the 'finish' of his work. Eberhard Keil, Baldunicci's informant, who probably knew Rembrandt from 1642-1650, must have inspired Baldinucci to write about

Rembrandt's lack of conformity, and that his singularity in his way of painting corresponded to his way of life.[20]

Dealing with Rembrandt as an artist, and more especially as a 'technician', without allowing for that aspect of wonder in contemporary reception of his work as well as his person, does not do justice to the phenomenon 'Rembrandt'. This is what I gradually had to admit while searching for ways best to fit Rembrandt's behaviour as an artist as much as possible into the practice and the art-theoretical concepts of his time. Science strives after regularities and systems, aims at enlarging the field where order and predictability prevail. While writing on the late Rembrandt's working procedures (Chapter VIII), I touched on the limits of that approach. Joyfully, I had to admit that in the end Rembrandt could not be fully 'domesticated'. Beyond a certain level he has to be approached via categories which the art historian tends to fear because they seem anachronistic or even romantic, the categories of art, rather a1174than craft, of creation, rather than production.

It was useful to postpone the moment of that discovery as long as possible, as it forced me to start searching at the most trivial level. While investigating Rembrandt's panels and canvases (see Chapters II and V), friends mocked me for enjoying the backs of Rembrandt's paintings – so they thought – more than the painted fronts. Starting with the aspect of the 'craft' of Rembrandt's activity, with the aim of finding certain systems in the different aspects of his activity, as I did in Chapters II, V, VI and IX, I tried to find the boundaries between craft and creative freedom. In identifying these boundaries the feeling grew that I was getting hold of some of Rembrandt's most essential pictorial aims. The chapter dealing with the seventeenth-century use of the palette (Chapter VI), and the one on colour and tone, and on concepts such as 'houding' and 'sprong' (Chapter X), contain, I believe, keys to the understanding of Rembrandt's most important concerns, those praised so much by his younger fellow artists.

[h2] Epilogue on Quality

In the chapter on Rembrandt's dealing with illusionism and the visible brushstroke (Chapter VII), it became clear that the tracks of Rembrandt's hand, the visible brushstroke, has always had a strong impact on viewers of his work. In that chapter the concept of 'sprezzatura' (looseness, nonchalance) in the handling of the brush was briefly dealt with. The reader may remember that Castiglione, in his Book of the Courtier, compared the advisable looseness in the behaviour of the gentleman with the looseness in the brushwork of the painter. In modern terms one could speak of the 'sprezzatura' of the courtier as a body language that is compared with the artist's wielding of the brush. But there is another body language, an internalized movement, as it were, that plays a role in the perception of painting, drawing and etching – particularly with the painting of an artist like Rembrandt.

I want to close this book with some personal remarks on this aspect of Rembrandt's art, especially as it deals with an aspect which for many people represents Rembrandt's technique per se. These remarks have to be personal, as it requires introspection to get hold of the sensations which go with that particular side of Rembrandt's art. This aspect of the reception of Rembrandt's art may have had a great impact on the appreciation of Rembrandt – in his own time as well as today. It concerns the bodily experience of his work.

The fact that a bodily sensation is involved in what seems to be 'only' a visual activity – looking at art – may already have been known in Rembrandt's time. I think it can be read in a passage in Hoogstraten which deals with 'skill'. 'Skill', Hoogstraten writes, 'comes through much exercise, and continuous doing'; he then adds a sentence that betrays his awareness of the involvement of the body in the contemplation of art: 'Moeilijk gedaen, moeilijk om te zien, zegt men',[21] which, to my mind, could best be translated 'As the saying goes: what is done labouriously is tiring to look at'.

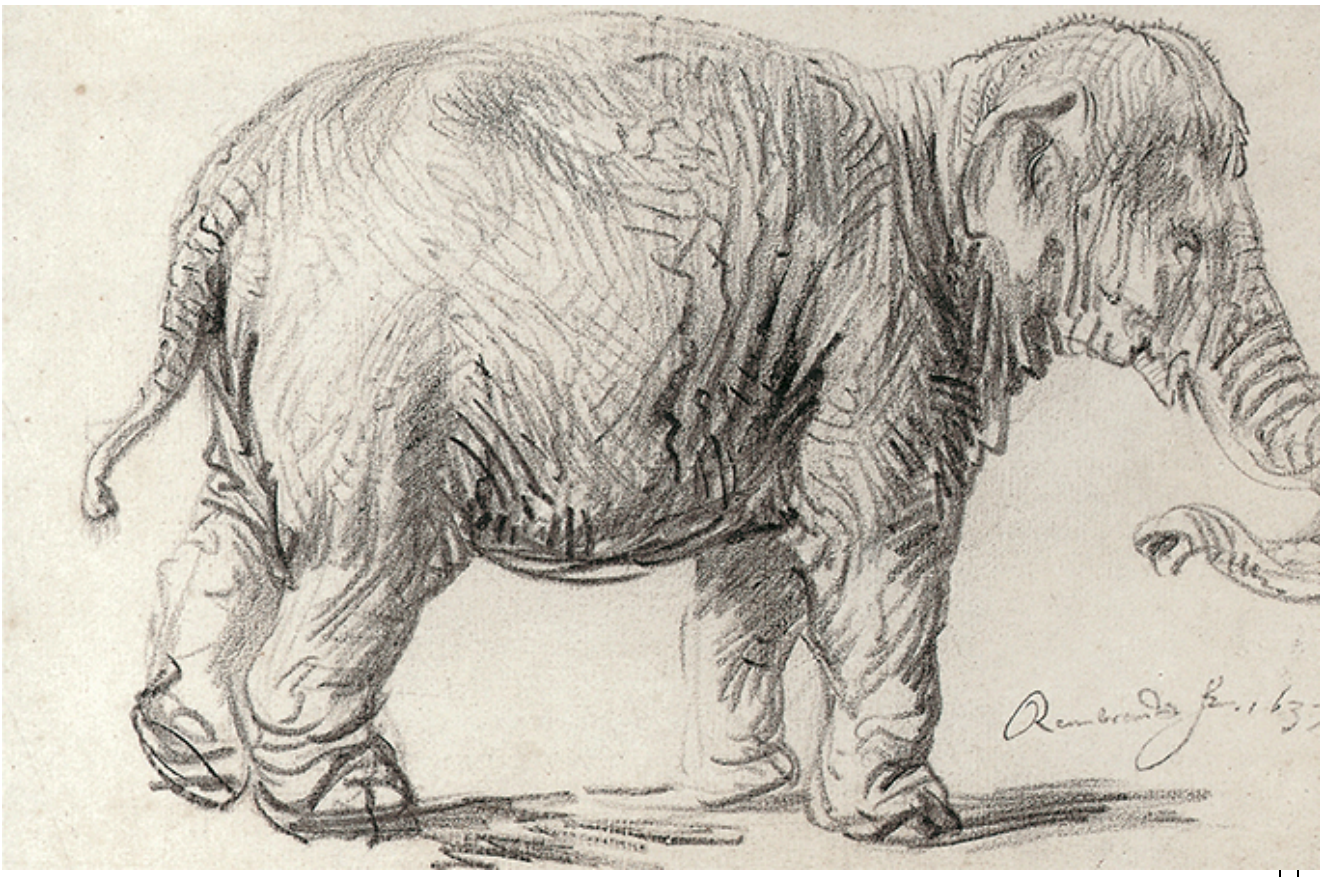

fig. 327Rembrandt, Study of an Elephant, 1633. Drawing in chalk, 14 x 9 cm. Vienna, Albertina

The reader of this book will already have noticed that like so many other a1178people, I am fascinated, even moved in a mysterious way, by Rembrandt's brushwork. A significant part of my satisfaction and joy when looking at his work is due to the specific quality of the lines in his drawings and etchings, and of the brushwork in his paintings. One might call these lines and strokes 'spontaneous'. In connection with spontaneity in art, the neurophysiologist Denier-Van der Gon has demonstrated that skills developed through intensive practice lead to spontaneously executed movements that are very similar to reflex movements.[22] The artist's movements, though in part unconsciously executed, are in fact under complex neuromotor control. Our reception of these lines and brushstrokes is, I believe, influenced by the fact that the movements we observe are as it were echoed in our own bodies in the sense that we latently participate in these movements. Everybody knows that one experiences intense pleasure in observing spontaneity, whether in watching people engaged in sport, a skilled craftsman, or an artist at work, because we experience what we see not only with our eyes but with our whole body.[23] We have this same physical experience and feeling when only traces of this movement remain – traces like the tracks of a skater scored in a1181fresh ice, the graceful handwriting of a well-written letter, the chisel marks on a sculpture, the lines drawn on paper, or the brushstrokes on a painting. When we are looking at spontaneity or at its traces, we seem to enjoy the experience of the artist's movements, and, as it were, to taste their spontaneity or freedom.

fig. 328Rembrandt, Winter Landscape, 1646. Panel, 16 x 22 cm. Kassel, Staatliche Kunstsammlungen

The quality of this physical 'echo' in the spectator, however, depends on the particular properties of the movement which were preserved in the traces they have left. What strikes me so much about Rembrandt each time, for example, is the extraordinary concentration with which he must have worked. But how, I ask myself, do I register this concentration? I believe this to be related to the high degree of variation in the way the spontaneous stroke or line serves the shaping of the image. With Rembrandt the scale of these movements can vary enormously within one work, while at the same time all these movements in concert demonstrate a certain rhythm.

It is striking that with lesser artists, let a1183us say Fragonard or, to take a worse case, the Dutch forger Han van Meegeren (who in his own work dealt wholesale in spontaneity), this spontaneity has a certain hollowness to it – there is so much less concentration and differentiation to it than with someone like Rembrandt. With lesser artists, the ambition toward spontaneity tends to be self-complacent; you register this immediately with your invisible manual accompaniment and you experience it as a kind of insincerity. With Rembrandt and other great artists with a spontaneous hand, on the contrary, you register unconsciously that the spontaneity has itself no deliberate aim, it is not even a means, it is a self-evident and integral part of their artistic skill. This spontaneous movement is not just the

manifestation of a vitality of temperament, as one might think; it serves more specifically a quite different factor in their artistry, perhaps the most important of all: the imagination.

Painters like Rembrandt were able to grasp the shadows raised by the imagination only by means of a skill that is now scarcely imaginable. If we want to get an idea of the discipline and skill of a painter like Rembrandt today, we would do better not to look at the great majority of our contemporary painters, but at the performing musician or ballet dancer. In these arts, it is still understood that professional skill can only be built up through endless practice from an early age on; and as we saw in Chapter III, the same pertained just as much in Rembrandt's day to the art of drawing and painting. But it should be added that whoever inquires more than superficially into the careers of those dancers and musicians of our own time who have practised all their lives, will realize that only a few are able to command that unique set of qualities and talents that are necessary in order to develop into major artists. Without that basis of skills, there is, however, no way that this can happen.

I am convinced that it is the power of imagination and the dream-like spontaneity with which the image is grasped that provide the key to Rembrandt's art. There are innumerable paintings, drawings, sculptures, novels, symphonies, etc. that are competently put together, but which are little more than the sum of their parts. With great art, however, it seems that there must have been a powerful image lying at the root of the whole process. The artist appears, as it were, to move within that image while he is at work. He is what he is making. The variation in the quality of the handwriting and the differentiation in the rhythm of the hand, the delightful combination of uninhibitedness and appropriateness, seem to be dictated by the force with which that image is kept alive in the artist's imagination. In Rembrandt's case, as discussed in Chapter IV, there are indications that he did in fact conceive his works from imagination. And whether he subsequently worked from nature or gave form to a conception born purely of fantasy would seem to make little difference after that.

Time and again I feel myself drawn into Rembrandt's spaces, where figures and objects – but I myself as well – get a specific weight and balance. And in a way that is certainly difficult to prove, this is in part due to my conviction that this space a1184is not 'made' but has 'become'; and that this is so because its maker did not 'make' but 'was'. One experiences the same sensation with really good poetry. It is one of the most intriguing aspects of art, and in my view it is just this which gives art a certain moral quality. Only great purity in the experience of the world to be represented in a work makes it possible to be what you make, rather than to manufacture it. This, I believe, is the only way to explain how the artist, in deploying his resources, acquires this remarkable uninhibitedness which causes the spectator to feel that the work could only be thus and not otherwise, unless strictly theoretical considerations, such as, for instance, the rules of classicist art, start to interfere with the spontaneity in perceiving the work either in the seventeenth century or now.a1185

fig. 329Rembrandt, The Abduction of Proserpina, c. 1630. Panel, 83 x 78 cm. Berlin, Gemäldegalerie

fig. 330Rembrandt, Rembrandt's Studio with a Model. Drawing, pen and wash, 20,5 x 19 cm. Oxford, The Ashmolean Museum

a1188

In this account of my physical experience of Rembrandt's works, it would seem that 'my' Rembrandt would be a kind of proto-expressionist who eliminated reason (as far as possible) in order to achieve the purest possible results. This would be in conflict with what was elaborated on in the previous chapters.

When looking at the genesis of Rembrandt's work – by investigating the different states of an etching, in reading the efforts to solve a problem in a drawing, or through analyzing a painting's genesis by scrutinizing its surface or using X-radio-graphy and other radiographic techniques – it becomes apparent that the quality of Rembrandt's art is also determined by a deliberate enhancement of certain pictorial effects during the conception of the work or during the working process. Of course the quality of art is not only determined by semi-consciously performed gestures while grasping an image. It is also determined by the intelligence with which the means of that art are contemplated and by the ability of the artist to administer their application in such measure that the viewer (in other arts the listener or the reader) is, as it were, manipulated to perceive what the artist wants him to perceive.

Rembrandt, through a multitude of both small and larger alterations made in the course of the work, enhanced the composition, adjusted the balance of light and shade, regulated the concentration of lighting, revised the contours and, in history pieces, changed the narrative 'stage direction'. No other conclusion seems possible than that Rembrandt did all this in order to direct the eye of the spectator in such a way that the experience of the image would be more effective in many different senses. The art theory of the Baroque was permeated with ideas on how to direct the eye of the spectator. There can be no question that Rembrandt was aware of these ideas. But as a spectator one nevertheless does not get the feeling that a painting was the object of calculated manipulation for him, or the mere straining for effect, even though the effects in Rembrandt's work are often highly accentuated. The importance of the role of the integrity of the hand, the power of the imagination, the identification with what is depicted becomes evident here and prevents the work from becoming a well-thought-out panopticum.

A plainspoken definition of art might be that art is what an artist makes; an artist is someone who makes art. The artist at a1189work, without whom art could not exist, stands at the centre of this circular definition. In Rembrandt's case, we would be dealing with a distant stranger long since returned to dust, were it not for the fact that his work still exists. Or is that actually also distant and strange? Do we only imagine that we have access to it?

fig. 331Rembrandt, Self-Portrait, 1669. Canvas, 85 x 61 cm. Florence, Gallerie degli Uffizi

a1191Well, yes and no. It is certainly stranger than we tend to think. The existence of an enormous art-historical literature with conflicting interpretations of his person and his work sufficiently demonstrates that. Yet in spite of this, there are the direct, legible traces of the artist at work, traces we can experience physically and emotionally while we are looking, given the 'risk' that we project more into it than was meant by the artist. For me, the fact that so many have been so intensely fascinated by that work since Rembrandt's own time, can hardly be only the result of a spurious myth. Taking this as my premise, I have tried in this epilogue to articulate what it is in Rembrandt's work that provokes this fascination.
At the beginning of this last chapter, the visit of the young prince Cosimo III was evoked as a companion piece to the account of the visit by notary Van Swieten, reported on in Chapter I. In the case of both visits we were left wondering what both visitors could have seen if they had entered Rembrandt's studio. Van Swieten only remained near the front door. Cosimo may have seen the studio (fig. 330), but maybe not: Keil reported on Rembrandt to Baldinucci

that he would not even have given access to an emperor if he were at work!

But if Cosimo had entered, one wonders if he would have seen much. We do not know how sophisticated Cosimo's interest in painting really was. Most of the paintings he ordered on his voyage through the Netherlands were portraits of beautiful young ladies he had met on his trip – mostly the daughters of respected families. When Cosimo bought or ordered paintings because of their painterly quality, he preferred works by 'Fijnschilders', meticulously executed paintings like those from the other two masters mentioned in the logbook as 'famoso' and visited by the prince, Gerard Dou and Frans van Mieris. He never collected work by Rembrandt. But eventually he did buy one of his works. There is reason to surmise that Cosimo visited Rembrandt again on his second visit to Holland one and a half years later, and that on that occasion he purchased one of the last self-portraits of the old painter (fig. 331). It is not improbable that this was his first acquisition for the gallery of self-portraits of famous painters – the Galleria degli autoritratti – that is still preserved in the Uffizi. That badly-preserved self-portrait, with its rough execution and striking 'materiality', demonstrates that Rembrandt's identity, probably also for prince Cosimo, is as much represented by his countenance as by the emphatically applied traces of his brush. It would seem that the present book has brought us right to the heart of what for the seventeenth-century spectator made up one of the essential features of the legendary Rembrandt: the painter at work.

[h1] Biographical Data, and Chronological List of Rembrandt's Works Reproduced in this Book

This short survey of Rembrandt's life gives priority to his development as an artist over other biographical information. It also serves as a framework to place in a chronological order the works discussed and reproduced in this book.

a1193 a1194

fig. 331aRembrandt, *Selfportrait as St. Paul*, 1661. Canvas, 93.2 x 79.1 cm. Amsterdam, Rijksmuseum.

Chronological list of works by Rembrandt (or attributed to him) reproduced in the present book, with reference to the figure numbers. The figure number in italics refers to the figure with the nearly complete image, the other figure numbers to details. Radiographic images and other technical images have not been included in this list. If not otherwise indicated the works listed are paintings (see also the Concordance pp. 337-339)

Br. = Bredius numbers (paintings)

Corpus = not in Bredius (paintings)

B. = Bartsch numbers (etchings)

Ben. = Benesch numbers (drawings)

Year / Title and whereabouts / Ref. no. / Fig. number(s)

The earliest Rembrandt biography appeared in Jan Jansz Orlers' Beschrijvinge der Stadt Leyden, Leiden 1641 (second edition), p. 375.

For the most recent biographies see A.Th. van Deursen, 'Rembrandt and his Age: The Life of an Amsterdam Burgher' and S.A.C. Dudok van Heel, 'The Changing Portrait of the Artist', in: Rembrandt. The Master and his Workshop, Amsterdam/Berlin/London 1991, resp. pp. 40-49 and 50-67.

For the sources on Rembrandt's life see W. Strauss & M. van de Meulen, The Rembrandt Documents, New York, 1979.

[H2] 1606

Rembrandt was born on 15 July in Leyden. Unlike many painters of his time, he did not come from a family of artists or craftsmen; his father was a miller.

[H2] 1613

a1198He attended the Latin school, the only formal education he received. Biblical studies and classics were the main subjects taught. It is not clear whether he finished school. His first biographer, the Leyden burgomaster Jan Jansz Orlers, suggests that he was taken from school prematurely and at his own request sent to be trained as a painter.

[H2] 1620

On May 20th Rembrandt was enrolled in Leyden University, possibly – and not unusually with Leyden boys – for tax reasons alone

[H2] C. 1620-24/25

He trained as an artist. The exact dates of the training periods are not known. As was not uncommon in his time, he had two masters in succession. The first was the Leyden painter Jacob van Swanenburgh, with whom, according to Orlers, he stayed for about 3 years, and who must have trained him in the basic skills and knowledge necessary for the profession. The second teacher, Pieter Lastman living in Amsterdam, who was well known at that time as a history painter, developed Rembrandt's ability and knowledge necessary to become a history painter too.

[H2] C. 1625

Rembrandt settled in Leyden as an independent master. His earliest works provide a commentary, as it were, on Pieter Lastmans work, see figs. 29, 30. His production as a painter in the Leyden period was mainly devoted to small scale history paintings and 'tronies', single half-figures that were not meant to be portraits, although individuals must have posed for them (fig. 13), among them Rembrandt himself in the mirror (fig. 203).

During this period, Rembrandt collaborated closely – and may even have shared a studio – with the painter Jan Lievens (fig. 230), who had also received his final training with Pieter Lastman. Lievens was one year younger than Rembrandt but, as a child prodigy, had already advanced his own career, and it may well be that Lievens had a stronger impact on Rembrandt in these early years than vice versa (figs. 229-235).

[H2] C. 1626

Rembrandt made his first etchings. Whereas drawing is the natural pendant to painting, the decision to begin etching meant taking a separate, very important direction in Rembrandt's career. Much of his international fame must have been based on the widely disseminated prints he produced from these c. 300 etchings (see for instance figs. 45, 46, 319, 320, 325, 326). Some 78 of his etching plates have been preserved.

1626 *History Painting*, Leyden / Br. 460 / figs. 6, 24, 36, 37, 38, 39

1626 *The Baptism of the Eunuch*, Utrecht / Corpus A5 / figs. 23, 29, 30, 31, 317

1626 *Musical Allegory*, Amsterdam / Corpus A7 / figs. 16, 33, 222, 223, 224

1626 *Balaam and the Ass*, Paris / Br. 487 / figs. 40, 227

a1203From 1628 on, Rembrandt had pupils. Gerard Dou was one of them (see figs. 146, 148, 149). We usually know of the existence of Rembrandt's pupils only by chance; no official register of painters' trainees has survived in either Leyden or Amsterdam. We can make only a rough estimate of the number of Rembrandt's pupils, but – seen over his entire career – it must certainly have been fifty or so, and quite possibly many more. Joachim Sandrart wrote of 'countless pupils' in his studio. A pupil's parent had to pay annually 100 guilders tutelage, a substantial sum in those days. Not only this tutelage, but also the sale of by his pupils' works, added to Rembrandt's income. Rembrandt's early fame attracted many young men – also from abroad – who were ambitious to become his pupil once they had completed their basic training period elsewhere. It seems that a number of them, among whom Isack Jouderville (see figs. 50,51), stayed on as studio assistants.

[H2] C.1628-1669

Rembrandt collected ethnographic and other objects which he probably depicted in his own works from 1628 onwards. (figs. 28, 107, 135). This collection – which also comprised numerous prints and paintings in which Rembrandt was dealing – added up to an encyclopedic collection of naturalia and artificialia. The inventory of Rembrandt's goods, drawn up on the occasion of his insolvency in 1656, reads like a catalogue of this enormous collection.

[H2] 1628-29

Rembrandt worked on the Judas Repentant (fig. 103). This painting was seen in his studio and highly admired for its narrative quality by Constantijn Huygens, the secretary of Prince Frederik Hendrik. This may well have led to the first known purchase by the Prince of a painting by Rembrandt (fig. 329). These purchases would continue until 1646 (fig. 111).

1627David Presenting the Head of Goliath to King Saul, Basel / Br. 488 / fig. 183
1628Two old men disputing (Peter and Paul), Melbourne / fig. 187a
1628Rembrandt laughing, private collection / page V
1628/29Study in pen and wash for the Judas Repentant, Amsterdam / Drawing, Ben. 9 recto / fig. 25
1628/29Study for the Judas Repentant, formerly Vienna / Drawing, Ben. 8 / fig. 104
1628/30Samson and Delilah, Berlin / Br. 489 / fig. 28
1629The Artist in His Studio, Boston / Br. 419 / figs. 102, 231
1629Judas Repentant, Returning the Pieces of Silver, Private collection, England / Corpus A15 / figs. 103, 105, 106
c. 1629Tronie with Rembrandt as a Model, The Hague / Br. 6 / fig. 203
1629/30St Paul at his Writing Desk, Nuremberg / Br. 602 / fig. 232
1630Jeremiah Lamenting the Destruction of Jerusalem, Amsterdam / Br. 604 / figs. 182, 236, 237, 238
c. 1630Jan Lievens in the Workshop, Malibu / Drawing, Ben. 390 / fig. 230
1630/31The Raising of Lazarus, Los Angeles / Br. 538 / fig. 42
1630/31The Raising of Lazarus / Etching, B. 73 / fig. 44 (in reverse)

[H2] 1629

He finished the Judas Repentant (fig. 103) and among other works painted the Artist in his Studio (fig. 102). The year 1629 marked a period in which – after an amazingly rapid and consistent evolution from 1625 onwards – Rembrandt reached a first peak in his artistic development.

The pictorial problems he set himself in that period (concerning the handling of light and differentiation of the paint substance) would later occupy him again intensively, especially in his later years.

[H2] 1630

a1208Beginning of a collaboration with the etcher Johannes Gillisz van Vliet, who brought a number of Rembrandt's early works in print. This was an accepted way to give one's artistic inventions a wider circulation. The collaboration lasted until 1635.

[H2] 1631

Rembrandt became acquainted with Hendrick Uylenburgh, who was an Amsterdam paintings-entrepreneur with a large workshop in which portraits were painted, restorations carried out and copies produced. Rembrandt apparently planned to leave Leyden for Amsterdam, which at that time was enjoying an economic boom whereas Leyden was in decline. To settle in another town and become a master of the guild, however, was not straightforwardly simple. In several towns it was the custom to demand that a younger painter should first serve an obligatory period of two years or so in the workshop of a local master before being admitted to the guild. This may be the reason why Rembrandt moved into Uylenburgh's workshop. We know that Rembrandt only became a member of the Amsterdam St. Luke's guild in 1634. Eventually, in 1634, he married Uylenburgh's niece, Saskia (fig. 47).

1631Bust of an old man, Los Angeles / fig. 46a
1631Old man with Gorget and Cap, Chicago / Br. 81 / fig. 13
1631Rembrandt's Mother as the Prophetess Hannah, Amsterdam / Br. 69 / fig. 316
1632Self-Portrait at the Age of 26, Glasgow / Br. 17 / fig. 1
1632Portrait of a Man Trimming his Quill, Kassel / Br. 164 / fig. 141
1632Portrait of a Woman, Vienna / Br. 330 / fig. 142

[H2] 1631-34

In Uylenburgh's workshop, with the occasional help of assistants, he produced a substantial number of portraits and group portraits (figs 141, 142, 144, 164, 165, 250).

1633Portrait of the Shipbuilder Jan Rijcksen and his Wife, London / Br. 408 / fig. 144
1633Bellona, New York / Br. 467 / fig. 185
1633Self-Portrait with a Soft Hat / etching, B. 7 / fig. 64; touched prints of the first state inside dust jacket and fig. 3

[H2] 1633

April 13th: the only portrait session that is recorded in a written document. Back in Holland for some weeks, the famous, banned preacher, Johannes Wtenbogaert, wrote in his diary

that he posed for Rembrandt that same day. The painting, commissioned by a member of the Remonstrant community of which Wtenbogaert was the most prominent preacher, is preserved in the Rijksmuseum in Amsterdam. Part of it – e.g. the preacher's hands - was clearly painted by a studio assistant.

1633 Self-portrait, Paris / Br. 17 / fig. 21

1633 Portrait of Saskia, Berlin / Drawing, Ben. 427 / fig. 47

c. 1633 Joseph Telling his Dreams, Amsterdam / Br. 504 / fig. 101

c. 1633 A Dog Sleeping in his Kennel, Boston / Ben. 455 / fig. 100

1634 Portrait of Johannes Elison, Boston / Br. 200 / fig. 164

1634 Portrait of Maria Bockenolle, Boston / Br. 347 / fig. 165

[H2] 1633-36

a1213Efforts to emulate Rubens. Rembrandt's activity as a history painter, certainly from 1633 on, was directed at the production of large sized paintings in a baroque style similar to Rubens (figs. 128, 132, 135, 158, 159, 314). He also tried to set up a production of prints for which he, like Rubens, provided the designs (figs. 101, 107, 138) and which were apparently meant to be executed on the plate by others, such as Johannes van Vliet. For reasons unknown, Rembrandt soon abandoned this project.

1634The Angel Appearing to the Shepherds / etching / B. 44 / first state fig. 45, second state fig. 46
1634Cupid Blowing Soap Bubbles, Vaduz / Br. 470 / fig. 133163(4) Portrait of Haesje van Cleyburgh, Amsterdam / Br. 354 / figs. 214, 216, 218, 220
c. 1634The Holy Family, Munich / Br. 544 / fig. 132
c. 1634The Lamentation, London / Br. 565 / fig. 136
c. 1634The Lamentation, London / Drawing, Ben. 154 / fig. 138
c. 1634/35John the Baptist Preaching, Berlin / Br. 555 / fig. 107
1635Flora, London / Br. 103 / figs. 293-296
c. 1635Belshazzar's Feast, London / figs. 162, 163 (reconstruction)
c. 1635The Apostle Paul, Vienna / Br. 603 / fig. 134
c. 1635Samson Threatening his Father-in-law, Berlin / Br. 499 / fig. 135
1636Danaë, St. Petersburg / Br. 474 / figs. 158, 161 (reconstruction)
1636The Blinding of Samson, Frankfurt / Br. 501 / figs. 159, 314, 321a
c. 1636Landscape with Two Cottages, Berlin / Ben. 466 recto / fig. 95
c. 1636Landscape with Two Men Standing by a Road, Berlin / Ben. 466 verso / fig. 96
c. 1637Two Cottages, Rotterdam / Ben. 341 verso / fig. 47
c. 1637Sheet of studies, Rotterdam / Ben. 341 recto / fig. 48

[H2] 1639

a1215A large house (the present Museum Het Rembrandthuis) was bought next to the house where he had begun his Amsterdam career with Hendrick Uylenburgh (see fig. 7). The fact that Rembrandt did not succeed in paying off the large sum of 13.000 guilders the

house costed contributed to his financial problems, which culminated in his bankruptcy in 1656.

c. 1637Study of an Elephant, Vienna / Drawing, Ben. 457 / fig. 327
1638Joseph Telling his Dreams / Etching in reverse, B. 37 / fig. 113
1638Sketch for Joseph Telling his Dreams (fig. 113), Rotterdam / not in Ben. / fig. 114
c. 1639An Artist Drawing / Etching, B. 192 / figs. 150, 151
1639Sketch in relation to the portrait of a young woman, Maria Trip (?), (fig. 109), London / Ben. 442 / fig. 110
1639Portrait of a Young Woman, Maria Trip (?), Amsterdam / Br. 356 / fig. 109
c. 1639Still Life with Peacocks, Amsterdam / Br. 456 / fig. 125
c. 1640The Stone Bridge, Amsterdam / Br. 440 / fig. 22
c. 1640Landscape, Braunschweig / Br. 441 / fig. 476
c. 1640The Concord of the State, Rotterdam / Br. 476 / figs. 26, 27
1641Portrait of Nicolaas Bambeek, Brussels / Br. 218 / fig. 309
1641Portrait of Agatha Bas, London / Br. 360 / fig. 310
c. 1641Cottages before a Stormy Sky, Vienna / Ben. 800 / fig. 97

[H2] C.1640

Rembrandt received important commissions for double or group portraits, among which was the Night Watch (fig. 245). In his group portraits he tried to apply solutions to compositional, narrative and lighting problems that he may have developed in other works. (Compare figs. 42 and 250; 95 and 245.)

[H2] 1641

In the first printed (1-page) biography by Jan Jansz Orlers, Rembrandt is described as 'so talented that he has since become one of the most esteemed painters of this century'.

[H2] 1641

In the Leyden painter Philips Angel's address 'In Praise of Painting', printed in 1642, Rembrandt was praised for his faithfulness of detail as a history painter.

[H2] 1640S

a1220In the years after 1642, Rembrandt's production in many respects changes. While his production of paintings diminished significantly, the variation in subjects, sizes and even in styles of the paintings is remarkable (compare figs. 312 & 328). The drawing and etching of landscapes became a major activity during this period (figs 97, 98, 99, 319). Later, in the course of the fifties, his production of paintings would return to its old level.

1642The Night Watch, Amsterdam / Br. 410 / figs. 245, 246-249, 256, 257, 260, 262
1643The Three Trees / Etching, B. 212 / fig. 319
1644Christ and the Woman Taken in Adultery / London / Br. 544 / page VIII

[H2] 1640S

Rembrandt reconsidered his use of colour. From 1627, he had tended to sacrifice colour in his effort to strengthen the 'spotlighting' effects in his paintings. In the 1640s he began searching for possibilities of a more frontal lighting in which larger areas of colour – particularly reds, yellows and whites – were allowed to retain their force (see for instance figs. 284 and 320). These changes accompanied a compositional tendency to place his figures more parallel to the plane of the picture. Although Rembrandt is often seen as the embodiment of anti-classicism, these changes can be seen as a move in the direction of the developing classicism of the time.

[H2] 1640S

There are indications that Rembrandt was very active as a teacher of young painters in this period. Among these young artists were Samuel van Hoogstraten (see fig. 244) and Carel Fabritius. Thanks to Samuel van Hoogstraten's book on painting, published in 1678, we have a great deal of indirect information on Rembrandt's ideas on art. (See especially Chapters VII and X)

[H2] C. 1645

Rembrandt began to alter his manner of painting, particularly his brushwork, reflecting the style of Venetian art (see Chapter VII).

c. 1645Landscape with a Castle, Paris / fig. 286a
1646The Birth of Christ, Munich / Br. 574 / fig. 111
1646Winter Landscape, Kassel / Br. 452 / fig. 328
1647Susanna and the Elders, Berlin / Br. 516 / fig. 312
c. 1649/50Landscape with a Farmstead, Chatsworth / Drawing, Ben. 846 / fig. 98
c. 1650Design for a frame for John the Baptist Preaching, (fig. 107), Paris / Drawing, Ben. 969 recto / fig. 108

[H2] 1652-1669

a1225Fifteen self-portraits painted. The fifties and sixties saw a marked increase in the number of self-portraits. Whereas Rembrandt painted 5 self-portraits between 1640 and 1650, the rate increases considerably between 1652 and 1669 to an average of one a year

(see, in chronological order, figs. 272, 284, 272, 283, 170, 284, 306, 254, 214 and 331). This does not imply – as commonly thought – that he had developed a more searching interest in his 'self'. There are reasons to suppose, rather, that there was a demand in circles of collectors and connoisseurs for self-portraits by the most highly esteemed painters of the time.

There is a marked increase in his production of portraits in the same period (see figs. 205, 265, 274, 289, 321, 239, 267).

1652Landscape with Haystack and a Herd of Sheep / Etching / B. 224 / fig. 99
1652Self-Portrait, Vienna / Br. 42 / figs. 272, 273
1653Aristotle with bust of Homer, New York / fig. 5a
1653St. Jerome reading in an Italian landscape / Etching, B. 104 / fig. 286b
1653The Three Crosses / Etching, B. 78 I / fig. 325
1654Portrait of Jan Six, Amsterdam / Br. 276 / figs. 205, 206
1654Woman Bathing in a Stream, London / Br. 437 / fig. 210
1654Bathsheba, Paris / Br. 521 / fig. 320
1655Titus at his Desk, Rotterdam / Br. 120 / page IX
c. 1655The Polish Rider, New York / Br. 279 / fig. 271
1655/60Portrait of a Boy, Pasadena / Br. 119 / fig. 265
1656Jacob Blessing the Sons of Joseph, Kassel / Br. 525 / figs. 211, 281
1656The Anatomy Lesson of Dr Johan Deyman, Amsterdam / Br. 414 / figs. 274, 275, 277-280
c. 1656Design for the frame for The Anatomy Lesson of Dr Johan Deyman, Amsterdam / Drawing, Ben. 1175 / fig. 276

[H2] 1656

Rembrandt went bankrupt, partly because of economic problems arising out of the Anglo-Dutch War of 1652 to 1654, and partly through his own financial mismanagement. His artificialia and naturalia, and the enormous collection of prints, which he and his pupils made use of when developing their own compositions and narrative solutions, had to be auctioned off. Apparently Rembrandt immediately started afresh to build up a similar collection.

[H2] 1660

After his house in Jodenbreestraat (see fig. 2) was sold in 1658, he rented a house in Rozengracht (see fig. 324). In a document from that year, it is stated that he was allowed to take with him 'two stoves and various partitions' that had been installed in the attic on behalf of his pupils. A passage in Houbraken's (see fig. 4) text on Rembrandt confirms that Rembrandt's pupils worked in separate cubicles.

1658Self-Portrait, New York / Br. 50 / figs. 284, 286
1658Woman near a Stove / Etching, B. 197 / fig. 321
1659Moses Breaking the Tablets, Berlin / Br. 527 / fig. 270

[H2] A122911660

Contract between Rembrandt, his son Titus (1642-1668; for his portrait see p. IX) and Hendrickje Stoffels, Rembrandt's common-law wife (1625-1663; fig. 210), designed to protect Rembrandt from his creditors and to enable him to continue working. The agreement entailed that Rembrandt should 'work in the service of' the other two parties.

c. 1659Oil sketch for the Göteborg Falconer (St. Bavo), Kopenhagen / fig. 167a
1659Self-Portrait, Washington / Br. 51 / figs. 283, 285
1660Self-Portrait, Paris / Br. 53 / fig. 170
c. 1661The Three Crosses / Etching, B. 78 IV / fig. 326
1661Head of a man, Milwaukee / fig. 253a
1661Portrait of Margeretha de Geer, Bust Length / Br. 395 / figs. 289, 290
1661Self-Portrait as St. Paul, Amsterdam / fig. 331a
1663The Syndics, Amsterdam / Br. 415 / figs. 239, 240-242, 252, 253, 299
c. 1663Self-Portrait as Zeuxis, Cologne / fig. 118, 306
1665Portrait of Gerard de Lairesse, New York / Br. 321 / fig. 189
c. 1665Self-Portrait, Stuttgart / (not in Br.) / fig. 15
c. 1665The Jewish Bride, Amsterdam / Br. 416 / figs. 173, 188, 191-202.
c. 1665Self-Portrait, London / Br. 52 / figs. 254, 266
c. 1665Family Group, Braunschweig / Br. 417 / figs. 209, 187b

[H2] 1667

Cosimo III, Prince of Tuscany, visited Rembrandt – in the travel journal indicated as 'the famous painter' – on 29 December 1667 (see Chapter XI). He may have bought one of Rembrandt's last self-portraits (see fig. 331) on a supposed second visit in the summer of 1669.

[H2] 1669

Rembrandt died on 4th October.

1667Portrait of an Old Man, The Hague / Br. 323 A / figs. 267, 268, 269
1667Portrait of a Man, Melbourne / Br. 323 / figs. 297a, 297b
1669Self-Portrait, London / Br. 55 / fig. 212
1669Self-Portrait, Florence / Br. 60 / fig. 331

[h1] a1233Notes

[H2] NOTES CHAPTER 1

1 Rembrandt doc. 1631/2, 1632/2.

2 Rembrandt doc. 1632/2

3 For details on a recently discovered, painted self-portrait see pp. 609-615. For the three drawn self-portraits on an early state of the etched Self-Portrait b.7 see for instance Martin Royalton-Kisch, *Drawings by Rembrandt and his circle in the British Museum,* London 1992, cat. no. 8a.

4 For my hypothesis that Rembrandt worked in the service of Hendrick Uylenburgh for two years to get permission to become master of the Amsterdam St. Luke guild, see *Corpus* vol. II, p. 56-60.

5 Bernard or Eberhard Keil, born in Helsingör in 1624 and died in Rome in 1687. In 1642 he became Rembrandt's pupil and stayed in Amsterdam for 8 years till 1650 probably in the service of Hendrick Uylenburgh. He was the main informant of Baldinucci on Rembrandt see note 6.

6 Baldinucci, p. 80.

7 Houbraken I, p. 269: 'Vele jare agter den anderen heeft hy het met schilderen zoo drok gehad dat de menschen lang naar hunne stukken moesten wagten, niettegenstaande dat hy met zyn werk vaardig voortging, inzonderheit in zyn laatsten tyd, toen het 'er, van na by bezien, uitzag of het met een Metzelaars truffel was aangesmeert'.

8 Hoogstraten, Aen den Lezer: 'Dat hy dit werk wel begeerde te leezen, maer dat hy op geenderley wijze zijn gevoelen daer van schriftelijk wilde bekent maeken: want, meende hy, dus zoude hy my de geheymen van zijn kons meededeelen, en onderwijzen, 't welk hy aen niemand, dan aen zijn Leerlingen of Discipelen, schuldig was.'

9 Houbraken I, p. 271: 'Hy had ook een eige wyze van zyne geëtste platen naderhand te bewerken en op te maken: 't geen hy zyne Leerlingen nooit liet zien; 't is ook niet te bedenken op wat wyze 't zelve gedaan is; dus is die vinding (even als de wetenschap van het Glas te koleuren, gelyk het Dirk en Wouter Crabet van Gouda hebben gedaan) met den uitvinder ten grave gedaalt.'

10 Seymour Slive, *Rembrandt and his Critics, 1630-1730,* The Hague 1953.

11 J. Emmens, *Rembrandt en de regels van de kunst,* Utrecht 1968.

12 Richard Buck in *Rembrandt after Three Hundred Years: A Symposium* (October 22-24, 1969) Chicago 1973, p. 94.

13 Eugène Fromentin, *Les maîtres d'autrefois. Belgique-Hollande,* Paris 1876, p. 406.: 'Dans sa pratique, il ne peignait, ne crayonnait, ne gravait comme personne. Ses oeuvres étaient même, en leurs procédés, des énigmes. On admirait non sans quelque inquiétude; on le suivait sans trop le comprendre. C'était surtout à son travail qu'il avait des airs d'alchimiste.'

14 Jacques Maroger, *The Secret Formulas and Techniques of the Masters,* New York 1979 (first edn. 1948), p. 139.

15 E. v.d. W(etering), 'Problems of Apprenticeship and Studio Collaboration, Corpus vol. II, pp. 45-90; Josua Bruyn, 'Rembrandt's Workshop – Function and Production', in: exhib. cat. 1991/92, pp. 68-89.

16 E.H. Gombrich, 'Rembrandt Now', *The New York Review of Books,* March 1970: 'Rembrandt's studio had the nature of a collective body of artists working under the supervision of the master'; A. Blankert, Ferdinand Bol (1616-1680). Rembrandt's Pupil, Doornspijk 1982, pp. 18-19.

[H2] A1252NOTES CHAPTER 2

This chapter is a revised version of an essay first published in *O.H.* 91 (1977), pp. 27-65 and *Corpus* I, pp. 11-33.

1 Br. 11, Br. 63, Br. 134, all painted around 1630, are on copper covered with gold leaf. Cf. W. Froentjes, 'Schilderde Rembrandt op goud', O.H. 84 (1969), pp. 233-237. Of other paintings on copper in Rembrandt's early style the authenticity is under discussion, Br. 425, Br. 533. Corpus I, cat. nos. c18, c10. As to Br. 533 see: The Bridgestone Painting Research Group, *In Darkness and Light: A Rembrandt in Tokyo Reconsidered,* Tokyo 1989.

2 Br. 183, Br. 504, Br. 539, Br. 546, Br. 565.

3 1*Archieven van de gilden,* Leiden Municipal Archives 1921, p. 76 no. 20, g.b.b. 1627, m 192 688: 'Alteratie & ampliatie' of the charter of cabinetmakers.

4 W. Martin, 'Een "Kunsthandel" in een klappermanswachthuis', *O.H.* 19 (1901), pp. 86-88.

5 The issue of Dutch seventeenth-century standard formats was first raised by W. Martin in the article referred to in note 4. During the work on *A Corpus of Rembrandt Paintings* the issue was 'reinvented'. See Corpus I, pp. 13-17; See also J. Bruyn, 'Een onderzoek naar 17de-eeuwse schilderijformaten, voornamelijk in Noord-Nederland', O.H. 93 (1979), pp. 96-115. For Miedema, the varying formats within each group raised doubts as to the existence of such standard formats in the seventeenth century. H. Miedema, 'Further research into 17th-century picture sizes in the North Netherlands', O.H., vol 95, 1981, pp. 31-49.

6 A. Bredius, *Künstler-Inventare* IV, The Hague 1917, p. 1468: 'Twee guldensmaten lysten sonder panneel; Twee 8 st[uyvers]maten lysten'.

7 A. Bredius, Künstler-Inventare VI, The Hague 1919, p. 2244: 'ebbe lysten: 4 sesentwintich maten, 4 guldens maten'.

8 1 Rhineland foot = 12 duim (inches) = 144 lijn (lines). 1 Rhineland foot = 31.395 cm, 1 duim = 2.616 cm.

9 Cf. Balaam (Br. 487) 63.2 x 48 cm, two planks; *David Playing the Harp to Saul* (Br. 490) 61.8 x 50 cm, three planks; *St. Peter in Prison* (Br. 607) 59.1 x 47.8 cm, single plank.

10 The panels of the *Balaam (Br. 487), the Baptism of the Eunuch (not in Bredius, see fig. 29) and the Musical Allegory* (Br./revised by Gerson 632, see fig. 16) are identical in size and make-up – two planks with the join at the centre. A further group of similar panels is formed by those on which the *Samson and Delilah (Br. 489) and the David Playing the Harp to Saul* (Br. 490) are painted: both have

identical dimensions, and the three individual elements (a wide plank in the centre and two narrower ones to the sides) have similar dimensions.

11 An example of the purchase of a series of identical panels might be detected in two items in the inventory of Jan Miense Molenaar (1668): ‘26 panelen van één stuck gelycke formaet' (26 single-plank panels of the same size) and ‘32 panelen wat groter van één stuck' (32 panels, somewhat larger, single-plank); see A. Bredius, Künstler-Inventare I, The Hague 1915, p. 6. See also P. Haverkorn van Rijsewijk, ‘Rotterdamse schilders; De Schilders Volmarijn', O.H. 12 (1894), pp. 136-159.

12 Clusters of panels from the same tree are: Br. 19, 175 and 451; Br. 21, 27, 206 and 441; Br. 36, 217, 355, 555 and 566. See for a full survey Corpus IV. As far as the Leiden period is concerned, these cases comprise for instance Br. 77, 466 and 535; Br. 69 and 543 (both panels from the same board).

13 *Bruyn, op. cit. (note 5), p. 113.*

14 *Corpus vol. I, cat. no. a42.*

15 P. Klein, D. Eckstein, T. Wazny and J. Bauch, ‘New Findings for the Dendrochronological Dating of Panel Paintings of the *15th to the 17th century', ICOM Committee for Conservation. 8th Triennial Meeting Sydney, Australia, 6-11 September, 1987. Preprints,* Los Angeles 1987, pp. 51-54. T. Wazny and D. Eckstein, ‘Der Holzhandel von Danzig/Gdansk-Geschichte, Umfang und Reichweite, Holz als Roh- und Werkstoff 45 (1987), pp. 509-513, esp. 513.

16 J. Bauch and D. Eckstein, ‘Woodbiological Investigations on Panels of Rembrandt Paintings', *Wood Science and Technology 15 (1981), pp. 251-263.*

17 P. Klein, ‘Hat Rembrandt auf Zuckerkistenholz gemalt?', in: *Zuckerhistorischen Beiträge aus der Alten und Neuen Welt, Schriften aus dem Zucker Museum,* Heft 25, Berlin 1988, pp. 37-43, esp. 40-41.

18 *Corpus II,* p. 91 note 3.

19 Br. 163 and 332. Corpus Vol. II cat. no. a45, c80. See also cat. no. A43.

20 M. Royalton-Kisch, ‘Over Rembrandt en van Vliet', *De Kroniek van het Rembrandthuis,* 1984, vol. 1/2, pp. 3-23. David Bomford, Christopher Brown, Ashok Roy, Art in the Making: Rembrandt, London 1988, pp. 44-47.

21 H. Kühn, ‘Untersuchungen zu den Malgründen Rembrandts', *Jahrbuch der Staatlichen Kunstsammlungen in Baden-Württemberg* 2 (1965), pp. 189-210. See also *Corpus* IV.

22 *Rembrandt after Three Hundred Years:* A Symposium, Chicago 1973, p. 94.

23 P. Coremans and J. Thissen, ‘Het wetenschappelijk onderzoek van het zelfportret van Stuttgart', *Bulletin de l'Institut Royal du Patrimoine Artistique 7* (1964), pp. 187-195. C. MüllerHofstede, ‘Das Stuttgarter Selbstbildnis von Rembrandt', Pantheon 21

(1963), pp. 65-90 and 94-100. R.H. Marijnissen, *Het Stuttgarts vermeend zelfportret van Rembrandt, Archivalia van een wetenschappelijk onderzoek,* Mededelingen van de Koninklijke Academie voor Wetenschappen, Letteren en Schone Kunsten van België, 52 (1992), nr. 1, pp. 3-18.

24 Cf J.A. van de Graaf, Het *Mayerne Manuscript als bron voor de schildertechniek van de Barok,* Utrecht 1958, pp. 9-13; see the discussion by Liesbeth Abraham, Jørgen Wadum and Koos Levy on 'imprimatura' and 'primuersel' in: *KM. Vakinformatie voor beeldende kunstenaars en restauratoren,* voorjaar 1995, p. 22; najaar 1995, p. 39; voorjaar 1996, p. 46.

25 Van Mander, *Levens,* fol. 216 verso. Van Mander, Grondt, pp. 594-595. See also the report of a seminar on coloured grounds, directed by H. Miedema and B.W. Meijer: 'De introduktie van de gekleurde schildergrond en de invloed daarvan op de stilistische ontwikkeling van de schilderkunst in het bijzonder in de Nederlanden van de 16de eeuw', Proef July 1973, pp. 123-150. See also: P.H. Hendy, A.S. Lucas, 'The Ground in Pictures', Museum 21 (1968), pp. 266-276, esp. p. 268.

26 Joyce Plesters, paper read at the Symposium on the technical aspects of Rembrandt's paintings, Amsterdam 23 September 1969.

27 a1280*See Corpus* I, cat. nos. a3, a5, a6, a7, a28. Cf. also K. Groen, 'Schildertechnische aspecten van Rembrandts vroegste schilderijen, microscopische observaties en de analyse van verfmonsters', *O.H.* 91 (1977), pp. 66-74.

28 E. Berger, *Quellen für Maltechnik während der Renaissance und deren Folgezeit,* Munich 1901, p. 118: 'pour le bois imprimé premierement avec la colle, susditte & croye, estant sec, gratté & equales avec le couteau, puis faîtes une couche legere avec blanc de plomb & ombre'; and p. 406.

29 Leiden Town-Clerk's Office Archives, 1575-1851, no. 9288 QQ 1673-1676: 'te gaen kopen ... tot haere groote moeyte en kosten' (transcription by J. van der Waals).

30 Appendix to van de Graaf's edition (see note 24), p. 138 no. 6; cf. also E. Berger's edition of the Mayerne Manuscript, op. cit. (note 28), pp. 102-103, cap. 2.

31 H. Miedema, De *archief bescheiden van het St. Lukasgilde te Haarlem,* Alphen a/d Rijn 1980, pp. 94, 95, 333, 337, 364, 422.

32 Karin Groen and Ella Hendriks, 'Frans Hals: een technisch onderzoek, in exhib. cat. Frans Hals, Den Haag 1989, pp. 109-127, esp. p. 116. See also note 24.

33 *Op. cit*. (note 22), p. 91

34 Not with the naked eye or magnifying-glass in 'open patches', nor using infrared or IR-reflectography methods; for some specimens by the latter technique applied on paintings by Rembrandt, see A.B. de Vries. M. Tóth-Ubbens and W. Froentjes, *Rembrandt in the Mauritshuis, Alphen a/d Rijn 1978, figs. 86 and 92.*

35 J.S. Held, *Rubens, Selected Drawings* I, London 1959, p. 19 fig. 1. *The Triumph of Mordecai* in the Rembrandt House, Amsterdam, of which an infrared reflectogram was made in the Central Laboratory, Amsterdam.

36 J. Hell, 'Beobachtungen über Rembrandts Malweise und Probleme der Konservierung', *Kunstchronik 10 (1957)*, pp. 138-141.

37 A warning against using white in mixtures can for instance be found in the Brussels manuscript; see for the French text Merrifield, *Original Treatises on the Arts of Painting, London 1849, II, no. 4 (Dover reprint, New York 1967),* pp. 810-813: 'but you must take care not to use too much white, for it is like poison, inasmuch as its splendour diminishes the grace and beauty of the painting; it also weakens other colours, and spoils their shadows'.

38 When examining a number of cross-sections and samples, Mrs. C.M. Groen found that the main component of these layers is a translucent brown of organic origin; see Karin Groen, op. cit. (note 27), esp. pp. 69 and 70. So far it has been impossible to tell which of the organic brown pigments in use in the seventeenth century – Cologne earth (Kassel earth), soot brown and bitumen – was in fact used. Froentjes believed that he had beyond question identified cologne earth as the main component of the underpainting (de Vries, Tóth-Ubbens, Froentjes, op. cit. (note 34), esp. p. 211).

39 Op. cit. (note 37), pp. 770-771: 'La pinceliere est un vase où l'on nestoie les pinceaux avec l'huile, et de se meslange on fait un gris ... (illegible) ... et bon à certains ouvrages commes à faire les premières couches ou imprimer la thoile. Le pincelier est un vase où l'on met tramper les pinceaux dans de l'huile, de peur qu'il ne se seichent.' See also: J. Plesters, 'Tintoretto's paintings in the National Gallery, Part II', *National Gallery Technical Bulletin 4 (1980), pp. 32-46, esp. p. 41.*

40 C. Müller-Hofstede, 'HdG 409, Eine Nachlese zu den Münchner Civilis Zeichnungen', Konsthistorisk Tidskrift 25 (1956), pp. 42-55, esp. p. 44. Peter Schatborn, Tekeningen van Rembrandt, zijn onbekende leerlingen en navolgers. Catalogus van de Nederlandse tekeningen in het Rijksprentenkabinet, Rijksmuseum, Amsterdam IV, Den Haag 1985 nr. 5.

41 Hoogstraten, p. 27: 'ontwerpt het geheel van 't geene gy voor hebt, eerst in zijn groote zwier, op uw papier' ... 'wat verder het ruw schetssen belangt, het is de eerste grontvest van 't wel teykenen, en van zoo groot een belang, dat, wanneer het gros ofte geheel, wel en verstandich is aengeweezen men daardoor dikwils meer verrecht, als er namaels met grooten arbeit kan werden uitgevoert'.

42 Van Mander, Grondt, ch. XII, 4: 'dat eenighe wel geoeffend expeerdichen en vast in hande-linghe doeck beraden [.....] gaen toe, en uyt der hand teyckenen veerdich op hun pennelen,'t ghene nae behooren In hun Ide's geschildert te vooren'.

43 Lydia de Pauw-de Veen, De begrippen 'Schilder', 'Schilderij' en 'Schilderen' in de zeventiende eeuw, Brussels 1969, p. 297.

44 K. Freise, Pieter Lastman, sein Leben und seine Kunst, Leipzig 1911, pp. 19-21, nos. 32, 33, 34, 64 and 66. This inventory, in which six dead-coloured paintings are mentioned at once, was made while Lastman was still alive.

45 A. Bredius, Künstler-Inventare I, The Hague 1915, p. 8 no. 163: 'Een stuckje van Brouwer gedootverruwt en van Molenaer opgemaeckt...'

46 Francis Haskell, Patrons and Painters, Art and Society in Baroque Italy, revised and enlarged edition, New Haven/London 1980, p. 15.

47 The word 'doodverf' (dootverwe) must be taken primarily to have meant 'the colour of a corpse' until well into the eighteenth century; cf. Woordenboek der Nederlandsche taal III-2, The Hague/Leiden 1916, col. 2881-2883. It clearly implied the absence of colour, which would originally also apply when used in connection with painting.

48 H. Vey, 'Anton van Dijck – Über Maltechnik', Bulletin van de Koninklijke Musea voor Schone Kunsten 9 (1960), pp. 193-201, esp. p. 195: 'Dootveruwsel wordt genoemt la maniera lavata, dat is, de gewaschen manier geheten; omdat hij den omtreck van binnen maer alleenlyck met eenerlij veruwe schijnt over-wasschen.'

49 Op. cit. (note 43), p. 248.

50 See note 48, p. 194: '2. doodverwsel [in the margin] 2. Dient hij sijn verwen nae den eysch der saecke recht wel te temperen, om t'stelsel, als het nu droogh genoegh is, een lichverdich coleur te geven'.

51 Van Mander, Grondt, ch. XII, 5: 'En vallender aen stracx, sonder veel quellen, Met pinceel en verv.', en sinnen vrymoedich, En dus schilderende dees werck-ghesellen. Hun dinghen veerdigh in doot-verwen stellen. Herdootverwen oock te somtijden spoedich, Om stellen beter: dus die overvloedich In 't inventeren zijn, doen als de stoute, En verbeteren hier en daer een foute.'

52 For instance in Corpus I, A5, A6, A28, A37.

53 This was written in 1976. See, however, note 54.

54 a1308E. Melany Gifford found the same procedure in her analysis of paintings by Jan van Goyen; see her article 'Jan van Goyen en de techniek van het naturalistische landschap', Jan van Goyen, exhib. cat. Leiden 1996, pp. 70-79, esp. p. 70. A great variety of seventeenthcentury paintings studied by students in seminars conducted by the author were almost without exception painted according to this procedure.

55 Joachim Gasquet, Cézanne, 1926, p. 130.

56 Cf, for instance, studio scenes by Aert de Gelder, Staedelsches Kunstinstitut, Frankfurt; J.A. Berkheyde, Uffizi, Florence; Cornelis Dusart (drawing), Rijksprentenkabinet, Amsterdam; J.C. Droochsloot, Macon; D. Rijckaert III, Louvre, Paris; G. Dou, private collection, Duisburg; see also W. Martin, Gerard Dou,

Stuttgart-Berlin 1913 (Kl. d. K.), no. 58 ff, among many other examples. See also figs. 146-148, 168, 180.

57 Bauch, Die Kunst des jungen Rembrandt, Heidelberg 1933, pp. 174-175; G. Knuttel, 'Rembrandt's earliest works', Burl. Mag. 97 (1955), p. 46.

58 Lairesse, vol. I, p. 12: 'Hierin komt 't mij voor, de allerwiste en zekerste wijze te zijn, het van achteren te beginnen inzonderheid wanneer het landschap meest te zeggen heeft. Derwijl na de helder of somberheid des luchts zich alle dingen schikken moeten, en de tinten der voorwerpen gevonden; want het licht op de voorgrond, en de kracht der beelden, moet daarna gepast worden, hetgeen, anders begonnen zijnd, zeer ongewis uitvallen zoude.'

59 The Angel Appearing to the Shepherds, b.44(I) (dated 1634 in state II ff); Christ before Pilate, b.77(I), 1635; The Artist Drawing from the Model, b.192, c. 1639; the etching of S. Jerome Reading in an Italian Landscape, b.104, c. 1653, also seems to have been produced in this way.

60 Lairesse, vol. I, pp. 13-14: 'Hier moetmen, om de beste manier te volgen, van achter beginnen, te weeten de lucht, en dus allengs na vooren toe, zo behoud men altoos een bekwame en vogtige grond achter de Beelden, om den uitersten omtrek daarin te doen verdwynen, het welk, anders begonnen, ondoenelyk is.'

61 Lairesse, vol. I, p. 13: '...dus onordentelyk begonnen, een onvermydelyke misstand & wanstaltigheid bekomen, die den Meester méér verlegen maken dan met een leegen doek'.

62 Lairesse, vol. I, p. 14: '... dat niet min aangenaem als nut is, te weten dat men gewaar werd dat het stuk vordert, en alles by malkander, zo in schikking, als houding wel staat, en daar door gedurig het oog kittelt en vermaakt, waardoor de lust [om door te gaan] zo menigmaal men het ziet, opgewekt en aangezet word'.

[H2] NOTES CHAPTER III

This chapter was first published in a shorter version in Dutch in O.H., 105 (1991) nr.4, pp. 210-227. Together with the other articles in that issue it was dedicated to Hessel Miedema. I greatly appreciate the help received from the following persons: Hajo de Boer, Paul Broekhoff, Achim Dudde, M. Haga, Egbert Haverkamp-Begemann, Cynthia van der Leden, Hessel Miedema, Dara Moscowits, Diederik Paauwe, Martin Royalton-Kisch, Greg. Rubinstein, Rob Ruurs, Marijn Schapel houman, Peter Schatborn, Robert W. Scheller, Ad Stijnman, Guus Sluiter, Els Verhaak, H. Voorn.

1 B. Haak, *Rembrandt. Zijn leven, zijn werk, zijn tijd,* Amsterdam 1969, p. 93.

2 *Ernst van de Wetering, 'Isaac Jouderville, a Pupil of Rembrandt', in: The Impact of a Genius; Rembrandt, his Pupils and Followers in the Seventeenth Century, exhib. cat., Amsterdam/Groningen 1983/84, pp. 59-69.*

3 *Most sources concerning Jouderville are published by Bredius in Künstler-Inventare VI and VII (Nachträge). Other sources can be found in E. v.d. W(etering), 'Problems of Apprenticeship and Studio Collaboration', in: J. Bruyn e.a. Corpus, vol. II, pp. 45-90, esp. pp. 77-87.*

4 *Corpus, Vol. I, no. c9.*

5 *On the ages of painter's apprentices, see Hessel Miedema, 'Over vakonderwijs aan kunstschilders in de Nederlanden tot de 17de eeuw' in: Leidsch Kunsthistorisch Jaarboek 5-6, (1986-7), pp. 268-282; E. van de Wetering*, op. cit. *(note 3), esp. p. 51-56; Ronald de Jager, 'Meester, leerjongen, leertijd. Een analyse van 17de-eeuwse leerlingcontracten van kunstschilders, goud- en zilversmeden', O.H. (104) 1990, pp. 69-111. Gabrielle Bleeke-Byrne 'The education of the Painter in the Workshop', in: Children of Mercury; The Education of Artists in the Sixteenth and Seventeenth Centuries, Providence, Rhode Island 1984, pp. 28-39.*

6 *Jean Héoard, Journal de Jean Héoard sur l'enfance et la jeunesse de Louis XIII, (2 vols.), Paris 1868. On the training in drawing see for instance: Wolfgang Kemp '...einen wahrhaft bildenden Zeichenunterricht überall einzuführen', Zeichnen und Zeichenunterricht der Laien 1500-1870: Ein Handbuch, Frankfurt am Main 1979; Laurie Rubin 'First Draft Artistry; Children's Drawings in the Sixteenth and Seventeenth Centuries, in: Children of Mercury*, op. cit. *(note 5), pp. 10-19.*

7 *For a survey of the successive steps in the training of the young seventeenth-century painter, see P. Schatborn, Figuurstudies; Nederlandse tekeningen uit de 17de eeuw, exhib. cat. Amsterdam/Washington 1981-82, esp. pp. 11-31.*

8 *Cited from Chittima Amornpichetkul, 'Seventeenth-Century Italian Drawing Books: Their Origin and Development' in: Children of Mercury*, op. cit. *(note 5), pp. 108-118, esp. p. 118.*

9 *W. Goeree, Inleidinge tot de Algemeene Teyken-Konst, Middelburg 1668; cited after the third edition of 1697, p. 19.*

10 *Jaap Bolten, Method and Practice; Dutch and Flemisch Drawing Books, 1600-1750, Landau Pfalz 1985 (first edition dissertation, Leiden 1979); see also Amornpichetkul*, op. cit. *(note 8).*

11 *Cited from Amornpichetkul*, op. cit. *(note 8), p. 117.*

12 *Hoogstraten, p. 26.*

13 *A slightly different interpretation of the painting was published by Paul van den Akker, 'Bij voorbeeld tekenen', Kunstschrift, 5, 1996, pp. 15-23, esp. 22.*

14 *Adalbert Stifter, Der Nachsommer, Boedapest 1857. Used here is the edition of the Bibliothek Deutsche Klassiker, Stifters Werke, Band IV, p. 235.*

15 *Alison McNeill Kettering, Drawings from the Ter Borch Family Studio Estate, (2 vols.), Amsterdam 1988.*

16 a1334*Kettering*, op. cit. *(note 15), vol. I, p. XXX.*

17 *The drawings reproduced here are catalogued by Kettering*, op. cit. *(note 15) vol. I, figures 59-66 resp. under cat. nrs. fig. 59: GJr 3; fig. 60: GJr 15; fig. 61: GJr 4; fig. 62: GJr 16; fig. 63: M 84; fig. 65: M 36; fig. 66: M 54.*

18 *Cennino Cennini, Il Libro dell'Arte. Used here is the annotated edition by Franco Brunello, Vicenza 1982, Cap. 5-7.*

19 *Joseph Meder, Die Handzeichnung ihre Technik und Entwicklung, Vienna 1923, pp. 164-168; Joseph Meder, The Mastery of Drawing, vol. I, translated and revised by Winslow Ames, New York 1978; James Watrous, The Craft of Old-Master Drawing, Madison-Milwaukee and London 1967. Both authors, though being aware of most issues dealt with in this chapter, concentrated mostly on the technical aspects of the working with metal-point.*

20 *I would like to thank Ann Jensen Adams for drawing my attention to this early illustration of a drawing- and writing-board. See on this work Philip Hendy, Isabella Gardner Museum. Catalogue of the Exhibited Paintings and Drawings, Boston 1931. Phyllis Williams Lehman, Cyriacus of Ancona's Egyptian Visit and its Reflections in Gentile Bellini and Hieronymus Bosch, New York 1977.Meder 1923* op. cit. *(note 19), p. 165 reproduces a fifteenth-century Florentine drawing which shows a boy drawing on what looks like a small tablet.*

21 *Cennino d'Andrea Cennini, The Craftsman's Handbook, translated by Daniel V.Thompson Jr., Yale University Press 1933; reprinted Dover Publications New York, n.d., p. 4 note 1.*

22 *Huygens, p. 70. Nat. Hist. XXXV 77.*

23 *Hoogstraten, p. 30.*

24 *Vasari (ed. G. Milanesi, Firenze, 1872-1882) vol. I, p. 370.*

25 *Van Mander, Levens, fol. 282 recto.*

26 *E.K. Reznicek, Die Zeichnungen von Hendrick Goltzius, Utrecht 1961, vol. I, pp. 2-3.*

27 *Kemp,* op. cit. *(note 6), pp. 26-31.*

28 *On the use of wax tablets see: W. Wattenbach, Das Schriftwesen im Mittelalter, 2nd ed., Leipzig 1875, pp. 44-75; Meder,* op. cit. *(note 19), pp. 166-167.*

29 *Meder,* op. cit. *(note 19), pp. 164-168. The possibility that 'tavolette' are confused with what usually are called 'model books' should not be overlooked. The incomplete booklet from the circle of Jacquemart Hesdin (last quarter of the 14th century) containing seven boards of prepared boxwood (ca. 13 x 7 cm) with drawings and sketches done in metalpoint is, in my opinion, in fact a bundle of tavolette used for practising drawing. The booklet, which is in the Piermont Morgan Library in New York, is discussed by Robert W. Scheller, in his book: Exemplum: ModelBook Drawings and the Practice of Artistic Transmission in the Middle Ages (ca. 900 - ca. 1450), pp. 218-225 (see also his colour plate VII) as a model book. Traces of removed drawings can be seen among the drawings now visible. The bone-meal (according to Scheller) gesso which would, however, not hold metalpoint line(s) seems to be bound here with a more stable binding medium than saliva.*

30 *Hessel Miedema, Kunst, kunstenaar en kunstwerk bij Karel van Mander; een analyse van zijn Levensbeschrijvingen, Alphen aan de Rijn 1989, p. 190.*

31 *Van Mander, Levens, fol. 219 recto.*

32 *Compare Reznicek,* op. cit. *(note 26), p. 52. Barbara Welzel was kind enough to draw my attention to the fact that in the inventory of Rudolf II's 'Kunstkammer' (1607-11) fol. 384 mention is made of a booklet with wooden pages used by the young Dürer, described as a 'langlet (oblong) hiltzin (wooden) tafelbüchlein, darein A.D. (in monogram) als er noch jung war, mit silbern stifft allerley gezeichnet t'. For a reconstruction of the booklet with metal-point drawing made during Dürers voyage to the Netherlands see: Albrecht Dürer, Skizzenbuch der Reise nach den Niederlanden (1520-1521), Basel 1958, with introductory remarks by Heinrich Wölfflin and Edmund Schilling.*

33 *Reznicek,* op. cit. *(note 26), pp. 52-53.*

34 *Van Mander, Levens, fol. 286 verso.*

35 *The De Mayerne Ms. (British Museum, Sloane 2052), ed. Ernst Berger, Quellen für Maltechnik während der Renaissance und deren Folgezeit, Munich 1901, vol. III, pp. 152-153 recipe 55. 'Papier à tablettes qui doibt estre choisy fort & bien collé, & iceluy se doibt mettre la paste sur laquelle on escrit auec vn stile d'argent, & quand*

on veult effacer il ne fault que passer par dessus vn pinceau molle trempé en eau commune ou Rose ou bien repasser par dessus de la paste. Apres d'en estre seruy long temps passés vn vernix, laissés seicher & vous escrires avec encre ou Rosette qui s'effacera auec vne esponge trempée en eau. Os de pourceau calcinés à blancheur.Os de cheval.Os de pieds de mouton, excellents.Corne de cerf & de daim, tresbonne.Mais sur tout les Coques d'oeufs non calcinées. Broyés comme les couleurs auec eau legeremen[t] gommée.Et enduisés sur le papier auec le pinceau.'

36 *An., [I.I.H….], De alleruijtgesoghten kunstten en weetenschappen, door een liefhebber van weeten-schappen uijtgevonden en bey een versaamelt, Amsterdam 1772-1784, p. 274. The manuscript is in the University Library Amsterdam, Handschriftenzaal II* e 19. Hayo de Boer and Ad Stijnman from the TinCL Data Base in Amsterdam, who drew my attention to this text, also found a printed eighteenth-century text with recepes concerning the preparation of erasable writing paper and tablets: Anon. Das aufs neue wohl zubereitete Tinten-Fasz etc., Helmstädt 1732, p. 39.*

37 *H. Voorn, De papiermolens in de provincie Gelderland, alsmede in Overijssel en Limburg, Haarlem 1985, pp. 164-165.*

38 *Reznicek,* op. cit. *(note 26), see for example cat. nos. k 262, 272, 314, 310, 317, 335, 348 etc.*

39 *P.C. Hooft, cited from Woordenboek der Nederlandse Taal, under the entry 'Tafelet'.*

40 *Annemarie van Toorn and Marijke Spies were kind enough to draw my attention to a manuscript by Laurens Reael, Refereynen, Baladens etc., University Library Ghent, Signature 993, in which reference is made to Egbert Meinertsz, who was imprisoned in 1568 in Amsterdam. As he was not allowed to use pen and paper, he wrote a poem in his 'taeffellet-boecxken', which was found in his 'dief-sac' when his clothes were sent to Embden.*

41 *Houbraken, vol. II, p. 129. I thank Ben Broos for drawing my attention to this passage.*

42 *K.G. Boon, Netherlandish Drawings of the Fifteenth and Sixteenth Centuries, The Hague 1978, cat. nr. 616.*

43 a1362*Barbara Gaehtgens, Adriaen van der Werff 1659-1722, Munich 1987, p. 442/3.*

44 *Marjan Scharloo, 'De almanakken van de Verenigde Oostindische Compagnie', Antiek 25/6 (januari 1991), pp. 286-292. Forthcoming is a dissertation on almanacs by Jeroen Salman, University of Leiden, with a chapter on 'schrijf-almanakken'.*

45 *See J. Watrous and J. Meder,* op. cit. *(note 19).*

46 *Leonardo da Vinci, Trattato della Pittura, translated and annotated by A. Philip McMahon, (2 vols.), Princeton 1956, vol. 2, p. 105.*

47 *On 12 october 1852, Clara Schumann notes in the joint marital diary that one of the listeners at a music session in their home was Jean Joseph Laurens, from Montpellier, an admirer of Robert Schumann, who came to do his portrait. Clara notes that he made 'very beautiful portrait drawings in chalk'. Participating in the same session was the then 20-years-old and as yet unknown Johannes Brahms. Dieter Kühn, Clara Schumann, Klavier, Frankfurt 1996, p. 403.The fact that Laurens portrays him with silverpoint on a piece of prepared vellum or paper which already contained rough written notes is evidence that the 'tafelet' still functioned as an erasable notebook in the middle of the nineteenth century.Mr. P. Szenassy kindly drew my attention to the fact that so-called dancing-cards, booklets used by female dancers to note the order of partners had erasable pages, to be written on with a metalpoint. I have not had a chance yet to follow that track.*

48 *Verbal communication. Marieke de Winkel plans to publish the sources on which she bases her arguments.*

49 *Rembrandt doc., 1634/2.*

50 *It is generally assumed that the two silverpoint drawings with landscapes and heads were produced in roughly the same period as the drawing of Saskia. As Rembrandt's production of landscape drawings started in the early 1640s the silverpoint drawings with landscapes cannot be matched directly with any of the landscape drawings in other techniques. Peter Schatborn kindly drew my attention to the background in b.121 from 1632 which contains a cottage comparable to that in fig. 48.*

51 *See b.365-368 and 374.*

52 *J. Bruyn, 'On Rembrandt's use of studioprops and model dawings during the 1670s, Essays in Northern European Art, Presented to Egbert Haverkamp-Begemann on his Sixtieth Birthday, Doornspijk 1983, pp. 52-60.; Jeroen Giltay, 'The Function of Rembrandt Drawings', Master Drawings, vol. 27, 2, 1989.*

53 *Jeroen Giltay, 'Een onbekende schets van Rembrandt', De Kroniek van het Rembrandthuis, 29/1 (1977), pp. 1-9.*

[H2] CHAPTER IV

1 Hoogstraten, p. 191.

2 Hoogstraten, pp. 237-238.

3 Houbraken I, pp. 166-168.

4 Ernst Kris und Otto Kurz, Die Legende vom Künstler, Vienna 1934. An English translation with an introduction by E. H. Gombrich appeared in 1979 under the title: Legend, Myth, and Magic in the Image of the Artist, New Haven and London.

5 Kris & Kurz op. cit. (note 4) pp. 69 ff.; Engl. edn. pp. 94-96.

6 Kris & Kurz op. cit. (note 4) pp. 97-98; Engl. edn. pp. 10, 120.

7 Ernst H. Gombrich, Art and Illusion, A study in the Psychology of Pictorial Representation, Oxford 1960. The fifth edition, sixth impression 1988 is used here, pp. 154-161.

8 Van Mander, Grondt, ch. XII, 4. The best known example of this approach as to the creation of a work art is found in Vasari's life of Leonardo da Vinci where Leonardo is described as standing in front of the Last Supper for 'half a day at a time, lost in contemplation'. According to Leonardo (as quoted by Vasari) 'men of lofty genius sometimes accomplish the most when they work the least, seeking out inventions with the mind [...] and reproduce from the images already conceived in the brain'.

9 E. Panofsky, Idea, 1960, p. 5, 74, note 20.

10 Emmens, pp. 133-134.

11 Hoogstraten, p. 237.

12 Van Mander, Grondt, ch. 10, 30 in the margin.

13 Melanie Gifford, 'Jan van Goyen en de techniek van het naturalistische landschap', in exhib. cat. Jan van Goyen, Leiden 1996, pp. 70-79.

14 Gifford, op. cit. (note 13), p. 76.

15 Gifford, op. cit. (note 13), fig. 66.

16 Emmens 1964, pp. 154-176; E. de Jongh (ed.), Tot lering en vermaak: betekenissen van Hollandse genrevoorstellingen uit de zeventiende eeuw, Amsterdam 1967, cat. nr. 12. H. Perry Chapman, Rembrandt's Self-Portraits. A study in Seventeenth-Century Identity, Princeton 1990.

17 Albert Blankert, 'Rembrandt Zeuxis and Ideal Beauty', Album Amicorum, J.G. van Gelder, 1973, pp. 32-39.

18 B.P.J. Broos, 'The 'O' of Rembrandt', Simiolus 4 (1970), pp. 150-184.

19 Hans-Joachim Raupp, Untersuchungen zu Künstlerbildnis und Künstlerdarstellung in den Niederlanden im 17. Jahrhundert, Hildesheim / Zürich/New York 1984 (Studien zur Kunstgeschichte dl. 25). Marieke de Winkel, Corpus IV, Chapter V.

20 Hans-Joachim Raupp, 'Musik im Atelier, Darstellungen musizierender Künstler in der niederländischen Malerei des 17. Jahrhundert', O.H. 92 (1978), pp. 106-129.

21 E. van de Wetering, ' "The Miracle of our Age", Rembrandt through the Eyes of his Contemporaries', in: A. Blankert e.a., Rembrandt: A Genius and his Impact, Melbourne/ Zwolle 1997.

22 Hessel Miedema, 'Johannes Vermeers Schilderkunst', Proef, Kunsthistorisch Instituut Amsterdam, september 1972, pp. 67-76, esp. 75.

23 M.L. Wurfbain, 'Vanitas-stilleven'; David Bailly (1984-1657), Openbaar Kunstbezit, 1969, 7.

24 E. J. Sluijter, Lecture during Vermeer Symposium, The Hague 1996.

25 Huygens, p. 90. See also Chapter II, note 56

26 Van Mander, Levens, fol. 225 recto.

27 Van Mander, Grondt, Chapter II, 3.

28 Van Mander, Grondt, Chapter XII, 4.

29 Emmens, p. 133, note 239. Aristotle, The Nicomachean Ethics with an English translation by H. Rackham, London/Cambridge Mass. VI, iv pp. 167/68.

30 J. Reynolds, Discourses on Art, ed. R.R. Wark, New Haven/London, p. 223.

[H2] A1405NOTES CHAPTER V

This chapter was first published in Corpus II, pp. 15-43. In preparing this chapter I received help and inspiration from many people, and most of all from the students and temporary assistants who worked in my department at the Central Research Laboratory for Objects of Art and Science in Amsterdam. They helped with the tedious thread-counting and measuring of cusping, etc. Their enthusiasm for this project has been an important stimulus for me. I am greatly indebted to Greet van Duyn, Brigitte Blauwhoff, Michiel Franken and Peter Dam, and to Loutje den Tex and Koos Levy-van Halm, who carried out most of the research into written sources and archival material. I owe much to discussions with Mr C.A. Burgers of the Rijksmuseum (Amsterdam), Frans Dijkhuizen of the University of Groningen, Dr M. Meier-Siem (Hamburg), Emil Bosshard of the Schweizerisches Institut für Kunstwissenschaft (Zürich), Karin van Nes of the Central Research Laboratory, Jan Diepraam (Amsterdam), Mrs M.G.A. Schipper-van Lottum (Amsterdam) and Truusje Goedings (Amsterdam). Early on the textile experts Dr J.E. Leene and Mrs R. Bolland did the thread-counts of a great number of seventeenth-century canvas weaves. I want to thank them together with all others who kindly supplied information. Dr Leene and Mr Bosshard were kind enough to read through the manuscript of this chapter and offer useful criticism.

1 Cf. A. Lucas, Ancient Egyptian Materials and Industries, London 1962, revised and enlarged by J.R. Harris, pp. 353 and 355.⏎

2 *Nat. Hist. XXXV, 51.*⏎

3 *See: E.D. Bosshard, 'Tüchleinmalerei – Eine billige Ersatztechnik?', Zeitschrift für Kunstgeschichte 45 (1982), pp. 31-42.*⏎

4 *See H. Miedema and B. Meijer, 'The Introduction of Coloured Ground...', Storia dell'arte 35 (1979), pp. 79-98.*⏎

5 *Quoted from Vasari on Technique, G.B. Brown ed. 1907, Dover Publications, New York 1960, p. 236. See also: C. Villers, 'Artists' Canvases. A History', ICOM Committee for Conservation, 6th Triennial Meeting, Ottawa 1981/2/1, pp. 1-12.*⏎

6 *Hoogstraten, p. 339.*⏎

7 *See Miedema and Meijer,* op. cit. *(note 4), p. 82.*⏎

8 *See Corpus I, p. XII and cat. exh. Röntgenonderzoek van de oude schilderijen in het Centraal Museum te Utrecht (by M.E. Houtzager, M. Meier-Siem, H. Stark, H.J. de Smedt), Utrecht 1967, pp. 61-63.*⏎

9 *See for instance: Jacqueline Marette, Connaissance des Primitifs par l'étude du bois, Paris 1961; J. Bauch and D. Eckstein, 'Den- drochronological Dating of Oak Panels of Dutch Seventeenth-Century Paintings', Studies in Conservation 15 (1970), pp. 45-50; J. Bauch, D. Eckstein and M. Meier-Siem, 'Dating the Wood of Panels by a Dendro-*

chronological Analysis of the Tree-Rings', N.K.J. 23 (1972), pp. 485-496; J. Bauch, D. Eckstein, G. Brauner, 'Dendrochrono- logische Untersuchungen an Eichenholztafeln von Rubens-Gemälden', Jahrbuch der Berliner Museen 20 (1978), pp. 209-221; J. Bruyn, 'Een onderzoek naar 17de-eeuwse schilderijfor- maten, voornamelijk in Noord-Nederland', O.H. 93 (1979), pp. 96-115.

10 *See for instance Th. v. Frimmel, Handbuch der Gemäldekunde, Leipzig 1904, pp. 14-18; [Chr. Wolters], 'Fabric Paint Supports', Museum 8 (1960), pp. 135 ff.; J. Rudel, 'Le problème du support dans l'histoire de la peinture', L'information d'histoire de l'art 7 (1962), pp. 158-164; K. Nicolaus, DuMonts Handbuch der Gemäldekunde, Material, Technik, Pflege, Köln 1979, pp. 35-38.*

11 *Thomas Brachert, 'Historische Keilrahmensysteme', Maltechnik/Restauro 79 (1973), pp. 34-38, with references to publications on the subject of historical stretcher systems by W. Brandt, R. Buck, R.E. Straub, W. Sle- sinsky, S. Summerecker, K. Wehlte and W.T. Chase and J.M. Hutt.*

12 *K. Wehlte, 'Altholländische Spannmethode für Gewebe', Maltechnik 63/64 (1957-58), pp. 38-42; K. Nicolaus,* op. cit. *(note 10), pp. 39-40, fig. 45.*

13 *J. Plesters and L. Lazzarini, 'Preliminary Observations on the Technique and Materials of Tintoretto', Conservation of Paintings and the Graphic Arts. Preprints of Contributions to the Lisboa Congress 1972, 1972, pp. 153-180, esp. 154-155; H. von Sonnenburg, 'Zur Maltechnik Murillos 2. Teil', Maltechnik/Restauro 86 (1980), pp. 159-179, esp. p. 176 note 5.*

14 See for instance L. Kuiper, 'Restauratie-ver- slag van Hendrick ter Brugghen's Aanbidding der Koningen', *Bulletin van het Rijksmuseum* 19 (1971), pp. 117-135, esp. 117 and fig. 3; K. Nicolaus, op. cit. (note 10), pp. 41-42, *figs. 46-48.*

15 *See note 8.*

16 *A.B. de Vries, M. Tóth-Ubbens, W. Froent- jes, Rembrandt in the Mauritshuis, Alphen a/d Rijn 1978, pp. 206, 214 and 216.*

17 *A. van Schendel, 'Notes on the support of Rembrandt's Claudius Civilis', Konsthistorisk Tidskrift 25 (1956), pp. 38-42.*

18 *Katalog der ausgestellten Gemälde des 13.-18. Jahrhunderts, Berlin-Dahlem 1975, p. 338, no. 802. The technical examination of the X-rays in connection with the original size of the painting was focused on the presence and depth of the cusping (personal communication of Mr Hans Boehm).*

19 *A.B. de Vries, M. Tóth-Ubbens and W. Froent- jes,* op. cit. *(note 16), p. 83, express astonishment at the unusually large width of the strip of canvas on which the Anatomy Lesson of Dr Tulp was painted. Van Schendel,* op. cit. *(note 17), pp. 40-41 states that the width of canvas used for the Claudius Civilis must have measured just over 200 cm, the equivalent of 3 ells.*

20 *For a history of lining see for instance Westby Percival-Prescott, The Lining Cycle. Fundamental Causes of Deterioration in Painting on Canvas: Materials, and Methods of Impregnation and Lining from the 17th Century to the Present Day. National Maritime Museum, Greenwich 1974; R.H. Marijnissen, Dégradation, conservation et restauration de l'oeuvre d'art, Bruxelles 1967, pp. 21-65. V. Schaible, 'Der Weg der Doubliertechniken. Versuch einer Zwischen-bilanz', Maltechnik/Restauro 89 (1983), pp. 250-256.*

21 *Edges of canvas that are pulled around stretcher-bars tend to weaken and eventually tear along the edge of the stretcher. Usually the ground and paint have flaked off at these places. As the removal of rusted nails was time-consuming and damage to the canvas could hardly be avoided, restorers used to cut the canvas along the outer edges of the strainer or stretcher and then line it, using the edges of the slightly larger lining canvas to restretch the painting, often on a new stretcher.*

22 a1428*Partial X-rays of 109 pictures attributed to Rembrandt and 76 attributed to pupils were assembled in the late 1920s by Alan Burroughs at the Fogg Art Museum, Cambridge, Mass. (see A. Burroughs in: Burl. Mag. 59 (1931), p. 3). In more recent years Dr M. Meier-Siem in Hamburg collected numerous X-rays of paintings in various museums. Jean Rudel, op. cit. (note 10), pp. 158-164, esp. 160 note 1, mentions the existence of a collection of canvas samples started by Jacqueline Marette in the Louvre.*

23 *A survey of the canvases used after 1642 will be published in Corpus IV.*

24 *With edges where the vague radiographic image of the lining canvas is not 'swamped' by the radioabsorbency of the painting itself, the weave of the lining canvas can often be made out.*

25 *V. Schaible, 'Die Gemäldeübertragung. Studien zur Geschichte einer "klassischen Restau- riermethode'", Maltechnik/Restauro 89 (1983), pp. 96-129.*

26 *Cf. figures 1 and 2 in A. van Schendel's article mentioned in note 17.*

27 *De Mayerne, in his manuscript preserved in the British Museum, gives several recipes for treating the back of a canvas, either with pure thickened oil (p. 5 verso; E. Berger, Quellen für Maltechnik während der Renaissance and deren Folgezeit, Munich 1901, reprint 1973, p. 104) or a size body-colour (p. 141, edn. Berger p. 312). Treatment with a radioabsorbent layer is dealt with on p. 141 (edn. Berger p. 314), where oil prepared with lytharge or minium is given preference. Anthony van Dyck provided De Mayerne with a recipe for treating a flaking oil painting, or prevent flaking, by applying a layer of oil with finely ground umber to the back of the canvas (p. 153 verso, edn. Berger p. 338). The structure of the fabric was – as a rule – treated with glue size, rubbed into the canvas to close and flatten the surface (cf. note 37), while the canvas structure at the back remained relatively open. This explains the difference between the radiographic images of the weave imprints at back and front of the canvas (cf. see also fig. 11 where at the righthand edge a drop of paint at the back of the canvas can be seen).*

28 *In the case of the Portrait of a Man Trimming his Quill (fig. 141), the Portrait of a Man (Br. 171) and the Portrait of Nicolaes Bruyningh (Br. 268) this crudely applied layer is still visible in the X-rays. In recent X-rays of Jacob Blessing the Sons of Joseph (figs. 211, 281, 282) such a layer no longer impairs the radiographic image.*

29 *op. cit. (note 25).*

30 *The common use made of X-ray negatives can be explained by the fact that areas where lead white has been applied show up light in the radiograph, which makes for easy legibility. The imprint of the canvas fabric in the radioabsorbent ground, however, shows up dark in an X-ray negative. In a positive print the threads show light, which facilitates the reading of the weave. The measurements included in this chapter, however, were for various reasons carried out mainly on negatives. Theoretically the radiographic image of the canvas has a slightly larger scale than the actual canvas, as the beam of X-rays is conical and the X-ray film and the ground layer with the canvas imprint are c. I mm apart. This distortion is too small, however, to affect the measurements significantly.*

31 *According to J. Plesters and L. Lazzarini,* op. cit. *(note 13), p. 154, 'the distinction between flax and hemp fibres, especially when they are aged and somewhat degraded, is apparently not easy to make' (see also* ibidem, *note 12). It seems that sailcloth was made of hemp fibres; cf. S. Lootsma, Historische studiën over de Zaanstreek, Koog aan de Zaan 1950, p. 108, where a hempmill ('hennip clopper moolen') is mentioned in connection with the sailcloth weavers' trade. Flax was apparently normally used for the finer linens, but the quality of the flax, even the year in which it was harvested and the soil it grew on could determine whether a certain batch of flax was to be used for coarser canvas such as sackcloth (cf. J. A. Boot, 'Het linnenbedrijf in Twente omstreeks 1700', Textielhistorische Bijdragen 7, 1966, pp. 21-64, esp. 22).*

32 *Hoogstraten, p. 339: 'lijnwaat, gaas of tijk, is bequaemst voor groote stukken ...' (linen cloth, gauze or ticking is most suitable for large size pieces). If by gauze an open-structured fabric is meant, this advice is surprising. So far, no Dutch canvas support with an open- structured, gauze-like weave has been met with; possibly Italian canvas types with a relatively open structure are referred to here (cf. Rudel,* op. cit. *note 10). Cf. also Simon Eikelenberg's manuscript notes on painting technique written about 1700 (Alkmaar, Municipal Archive), p. 404: 'Tot schilderen kiest men gemeenlijk zeyldoek of lijnwaet, dat digt en gelijkdradig is en weynig noppen heeft.' (For painting one usually selects sailcloth or linencloth, which is tightly woven and of equal yarn quality in warp and weft direction and which has few knots.) The equivalent of sailcloth was mentioned as 'canevas' (canvas). S. Lootsma,* op. cit. *(note 31), p. 176 cites an eighteenth-century letter in which mention is made of 'canefas of zeijldoeken' (canvas or sailcloths).*

33 *M. K. Talley, 'Extracts from the Executors Account-Book of Sir Peter Lely, 1679-1691: An Account of the Contents of Sir Peter's Studio', Burl. Mag. 120 (1978), pp. 745-749, esp. 747. In the same inventory canvas and 'satten' (satin) are listed as support material.*

34 *J.A. Boot,* op. cit. *(note 31), p. 44.*

35 *J. A. Boot,* op. cit. *(note 31), p. 21; S. Lootsma,* op. cit. *(note 31), p. 38; J.G. van Bel, De linnenhandel van Amsterdam in de XVIIIe eeuw, Amsterdam 1950, pp. 12-21.*

36 *S. Lootsma,* op. cit. *(note 31), p. 38; J.G. van Bel,* op. cit. *(note 35), pp. 21-47; J. Horner, The Linen Trade of Europe during the Spinning Wheel Period, Belfast 1920, p. 353; J. Bastin, De Gentse lijnwaadmarkt en linnenhandel in de XVIIe eeuw, Ghent 1968, p. 15; L. Guicciardini, Beschrijvinghe van alle de Nederlanden, Amsterdam 1612 (first Italian edn. 1567), pp. 97-98, 217. Nicolaas Witsen mentions in his Aeloude en Hedendaagsche Scheeps-Bouw II, Amsterdam 1671, p. 135, canvases of Dutch, French and Flemish origin for the rigging of a ship of a given capacity.*

37 *See for instance J. A. Boot,* op. cit. *(note 31), where an analysis is given of the diary of Aleida Leurink (1682-1755), daughter of the linen-factor Jan Leurink. Although she was the wife of a minster (in the village of Losser, Twente), she was commissioning weavers and trading canvas on a small scale.*

38 a1445*When the metric system was introduced, the city of Ghent published a list of new seals that were to be used to mark the linens, also including the old seals (Ordonnance et règlement concernant le marché aux toiles de la ville de Gand, 1806). This publication provides us with a survey of the traditional standard width. The ell was the unit of measure. Standard widths could also be based on fourth or even eighth and sixteenth parts of the ell. In this rather refined system of standard width one finds such widths as 5/4 (Brabant) ell = 87 cm, 6/4 ell = 105 cm, and 2 ell = 140 cm, which are also familiar from seventeenth-century sources. The exact length of the ell varied of course from region to region. For new information about not only the width but also the lenghth of primed canvases see: Xenia Henny, 'Hoe kwamen de Rotterdamse schilders aan hun verf?', exhib. cat. Rotterdamse Meesters uit de Gouden Eeuw, Rotterdam/Zwolle 1994/95. The length of primed canvases to be cut in pieces subsequently could amount up to 7 metres. A batch of unprimed canvas according to this source could have a length of about 60 metres.*

39 *Nicolaas Witsen,* op. cit. *(note 37), 11, p. 127. A common length for a batch of canvas of this width, called the 'webbenlengte', was 52 to 53 ells (cf. Boot, op. cit., note 31, pp. 42 and 44). See also note 38.*

40 *Only five paintings by Rembrandt on twill canvas are known, all of them from the 1660s (Br. 326, 401, 415, 417 and 482). Van Schendel* op. cit. *(note 17) mentions three more paintings in the Amsterdam Town Hall as being painted on twill canvas. Much earlier in the seventeenth century and also in the sixteenth century it was used sporadically. Van Mander once mentions 'eenen grooten doeck van tijck' (in the life of Frans Floris, Schilder-Boeck, Haarlem 1604, fol. 241). The Portrait of Dirck Barendsz. by Cornelis Ketel (from 1590) in the Amsterdam Historical Museum (inv. no. B5786) is on an intricately woven twill canvas. Pieter Isaacs' Compagnie van Kapitein Gillis Jansz. Valckenier, from 1599 in the Rijksmuseum, Amsterdam (inv. no. c 455) is on a plain twill (I owe the information concerning the Cornelis Ketel to H. Miedema, that on the Pieter Isaacs to E. Bosshard, Zürich); Abraham Bloemaerts'*

Adoration of the Magi in the Cen- traal Museum, Utrecht (cat. no. 18) is painted on a striped twill canvas (for a reproduction see M.K. Talley, Portrait Painting in England: Studies in the Technical Literature before 1700, 1981, fig. 24).

41 *Cases where two warp threads are crossed by one weft thread, as one sometimes finds nowadays with painters' canvas, were not found with seventeenth-century canvases.*

42 *The measurements were carried out with a Leitz thread counter (6 x magnification), each time over 2 cm. Depending on the number of available X-rays this was done 6 to more than 20 times in each direction. The average values of each set of measurements were then divided by 2 (to obtain the thread density per cm). The maximum and minimum values obtained are also given to provide an indication of the range of variation in thread density. With canvases composed of two or more pieces, the weave was measured separately in each piece. The choice of the places where measurements were taken was dictated by the degree of visibility of the canvas structure in the X-ray, though a reasonable spread over the surface was aimed at. Taking measurements on the same 'line' of warp and weft threads was avoided as much as possible. With X-rays where the canvas structure was too vague to allow for the use of a thread counter, counting was done with the naked eye and a ruler. For a specification of Froentjes' method of measuring, cf. A.B. de Vries, M. Tóth-Ubbens and W. Froentjes*, op. cit. *(note 16), p. 206.*

43 *Cf. W. Percival-Prescott,* op. cit. *(note 20), pp. 15-16.*

44 *Cf. Meier-Siem,* op. cit. *(note 8), p. 63. On the idea that the coarse surface of the canvas served mainly an artistic purpose, see also Wolters,* op. cit. *(note 10).*

45 *De Mayerne,* op. cit. *(note 27), gives various recipes that all testify to this intention. On pp. 5 and 5 verso (edn. Berger, p. 102) he mentions the smoothing of the first ground layer with pumice stone three times, and illustrates the priming knife, which is slightly curved in order not to cause scratches in the ground layer as the canvas yields to its pressure. On p. 87 (edn. Berger, p. 252) he again recommends smoothing ('en raclant') first with the priming knife and then ('eguale') with pumice stone of the first ground layer. See also pp. 90 (edn. Berger, p. 258), 96* (ibidem, p. 272) and 99 vo (ibidem, p. 278). *Only in one, very short description of priming, on p. 95 (edn. Berger, p. 268) is the smoothing not explicitly mentioned. Numerous other authors are also explicit about the wish to smooth the canvas by filling the fabric or pumicing the ground at some stage of the priming procedure. This is true of Vasari (Berger, p. 29), Borghini – who refers to Flemish canvas paintings – (Berger, p. 40), Armenini (Berger, p. 53), Volpato (M.P. Merrifield, Original Treatises on the Arts of Painting, New York 1967, 1st edn. London 1849, II, pp. 729, 731), Pacheco (Berger, p. 79) and Palomino (Berger, p. 82). Not a single source makes mention of the specific surface quality of canvas.*

46 *Cf. S. Lootsma,* op. cit. *(note 31), pp. 116-117.*

47 *In, for instance, the technical instruction sheet on the stretching of canvas issued by the Royal Academy for Visual Arts in Amsterdam, one is advised to have the warp*

direction always parallel to the longest side of the stretcher. This rule does not however apply to seventeenth-century paintings. Determining the warp direction does not present a problem with canvas of recent manufacture, provided it still has its selvedges. In the case of old paintings these have almost invariably been lost (cf. note 21).

48 *The widest seventeenth-century canvas in one piece with a linen weave that we know of is a painting from 1642 by Pieter Soutman in the Haarlem Frans Halsmuseum (inv. no. 3. 13); it is on a canvas which has a stripwidth of 204 cm (3 ell), as Mrs K. Levy kindly informed me. Mrs Levy also pointed out that a painting by P. de Grebber in the same museum, from which the edges have been cut, is on a canvas with a strip width of 192 cm (originally probably also 3 ell). The canvas of the Bucharest Haman Imploring the Grace of Esther (Br. 522; Corpus II b9), begun probably by Rembrandt around 1635, has a width of 187 cm. In view of the nature of the cusping along the long sides of the canvas, this must have been wider, possibly also 3 ell.*

49 a1457*In, for instance, Methods of Test for Textiles, British Standards Handbook no. 11, 1963, pp. 160-162, different methods are given for determining warp and weft on the (unstretched) fabric itself; these are of no use when trying to determine warp and weft direction from a radiograph. The methods we investigated but had to reject were the following:*

1. I) As warp threads usually meander more strongly than weft threads (cf. for instance Knut Nicolaus, op. cit. note 10, p. 40), their imprint in the radioabsorbent ground is as a rule deeper, resulting in a darker (or, in the positive, lighter) image in the radiograph. In most radiographs the canvas imprint does show the threads running in one direction as darker than those running perpendicular to them. In the case of one bolt of canvas used for several paintings (Br. 469, Br. 497 and the Munich Abraham's Sacrifice), the warp threads (identifiable on the basis of the direction of seams, the stripwidth encountered and a continuous weaving fault) are however found to show up markedly lighter than the weft threads, which are finer here than the warp threads. It appears from this that the extent of meandering depends on the relative fineness of the thread and not on the difference between warp and weft. This is also illustrated by the fact that the less the densities of warp and weft threads differ, the less the threads in one direction show up as a succession of dark dots in the radiograph.
2. II) Usually the greater number of threads/cm indicates the warp direction. See also J.A. Boot, op. cit. (note 31), p. 47, where in all cases analysed more warp than weft threads were counted. For the same reason as described under 1. this criterion cannot be used with complete confidence.
3. III) Assuming that deformations caused by the stretching of the canvas will extend further in the weft than in the warp direction, one might expect that measuring the depth of cusping would help in telling weft from warp. It is however something of a rarity to find a canvas that has not lost strips of unknown width along its edges.

50 *J.A. Boot,* op. cit. *(note 31), p. 30, found in the diary of Aleida Leurink that a coarser quality of less tightly-spun yarn of German origin was in some cases used for the weft threads, while a better, Dutch, quality was used for the warp.*

51 *This use of leftovers from the hackling of the flax for the production of coarser linens is frequently mentioned in the diary of Aleida Leurink, cf. J.A. Boot,* op. cit. *(note 31), p. 30. Hackling, according to G.H. Linton, The Modern Textile Dictionary, New York 1962 (1st edn 1954) s.v. hackle, is 'the device wed to clean bast fibra such as flax, hemp, etc. Iron teeth are set in a board so that the stock may be combed for the line fibres (the long fibres) and the tow fibres (the short fibres).'*

52 *See note 51.*

53 *This material is in part based on threadcounts published by Meier-Siem,* op. cit. *(note 8), pp. 212-297. The remaining part comes from threadcounts on radiographs of dated Dutch seventeenth-century paintings on canvas in the Rijksmuseum, Amsterdam. These threadcounts were carried out by J.E. Leene, R. Bolland and M. Franken.*

54 *In all likelihood the situation was quite different with painters from the nineteenth century. As a rule they used to buy large rolls of already prepared canvas. A pilot project of threadcounts applied to paintings by Vincent van Gogh revealed that of the ten canvases investigated five come from one bolt and four from another – all nine paintings having been produced in Arles. The canvas used for the tenth painting, produced in Paris, comes from yet another bolt. These counts were carried out and analysed by Brigitte Blauwhoff. Cf. Verzamelde brieven van Vincent van Gogh, ed. J. van Gogh-Bonger, Amsterdam/Antwerp 1953, 3rd edn., III pp. 453, 467, 473, 483 and 505.*

55 *A. van Schendel,* op. cit. *(note 17), p. 41, noted that at a certain point in the central strip of the Claudius Civilis (which is painted on a support consisting of three vertical strips) the weft threads become considerably finer, apparently due to shifting to another batch of yarn. Something similar may be observed in the righthand half of the lower strip of the canvas used for the Portrait of Susanna van Collen (Br.407), where a significant coarsening of the weft threads is seen.*

56 *A quantitative comparison is made difficult by the differences in the exposure data and reproduction techniques involved in producing the radiographic material used, and a statistical approach is virtually impossible. I am indebted to Frans Dijkhuizen, University of Groningen, for the discussions we had on the subject.*

57 *Br. 172 and Br. 341, Br. 200 and Br. 347, Br. 167 and Br. 331, Br. 218 and Br. 360. In the case of Br. 164 and Br. 330 the similarity between the respective canvases confirmed the already existing suspicion that these paintings were originally companion-pieces (see figs. 139-142).*

58 *The Berlin grisaille of St. John the Baptist Preaching (Br. 555) was enlarged twice. The first enlargement consists of a narrow strip of canvas coming from a canvas that had already been stretched and primed before, as it shows cusping that is unrelated*

to the process of enlargement; this strip comes from the same bolt as the canvases of Br. 173, Br. 470, Br. 499 and Br. 603. From the same bolt comes the canvas on which the pieces into which Rembrandt cut the London grisaille on paper of the Lamentation (Br. 565) were stuck. This piece, too, was a fragment of a canvas that had already been stretched and primed, as it shows cusping along only two sides. From the radiographic image of the canvas structure one gets the impression that the paper was stuck to the unprimed side of the canvas (see also note 27). The hypothesis may be put forward (see below) that these fragments come from the same piece of primed canvas on which the Cupid (Br. 470) was painted. Taking into account the warp direction and the cusping in these three pieces, the canvas of the Cupid comes from the top part of this piece, that of the Lamentation from the bottom left corner and that of the St. John Preaching from the righthand edge near the bottom.

59 *The reconstruction of the original size of the Danaë is discussed in: E. v. d. Wetering, 'Het formaat van Rembrandts "Danaë"', Met eigen ogen. Opstellen aangeboden door leerlingen en medewerkers aan Hans. L.C. Jaffé, Amsterdam 1984, pp. 67-72.*

60 a1469*An exceptional case is the mention in the estate of the Amsterdam painter Johannes Croon, who died in 1664, of '60 penneelen met 2 rollen doeck' (60 panels with two bolts of canvas); see: A. Bredius, Künstler-Inventare III, The Hague 1917, p. 845. Bredius presumed, in view of the nature of the inventory, that Croon was an art dealer as well and he could thus well have dealt in painters' supplies.*

61 *See Corpus II, Chapter IV, note 2, and J.M. Montias, Artists and Artisans in Delft, Princeton 1982, p. 163.*

62 *See Chapter II, notes 30 and 31.*

63 *Among the creditors mentioned in connection with the estates of painters, 'plumuyrders' (primers) are mentioned more than once; cf. A. Bredius, Künstler-Inventare II, p. 53 (1662), IV, p. 1392 (1665). They are also explicitly mentioned among the members of the Haarlem Guild of S. Luke (see H. Miedema, De archiefbescheiden van het St.-Lucasgilde te Haarlem, Alphen a.d. Rijn 1980, pp. 94, 95 (in 1631), 422 (in 1634), 334 (in 1702), 337 (in 1715). Other craftsmen listed among the creditors of painters may also have provided them with primed canvases, such as 'lijste- makers' (frame-makers) (see Chapter II, note 29) or cabinet-makers; in one inventory a cabinet-maker is mentioned as having provided a painter with panels and canvases over several years (Künstler-Inventare V, p. 1504). Even art dealers sold primed canvases; see Chapter II, note 4, where the art dealer Leendert Hendriksz. Volmarijn mentions canvases among the painting materials he intends to sell. His relative, the Rotterdam art dealer Crijn Hendriksz. Volmarijn, apparently also sold canvases as the painter Willem Buyte- wech owed him 'aen doeck (for canvas) 8 gld. 10 st. 14 penn.', of which one canvas – which Buytewech returned – is referred to as costing 3 guilders (P. Haverkorn van Rijsewijk, in: O.H. 12, 1894, p. 149). But not all painters relied on being able to purchase already-*

primed canvases. In one apprentice contract priming canvases is mentioned among the tasks the apprentice is to carry out (A. Bredius, Künstler-Inventare V, p. 1482).

64 *In Bredius' Künstler-Inventare one finds mention of 'leege doecken' (empty canvases), 'doecken ongeschildert' (unpainted canvases), 'doecken om op te schilderen op raemen' (canvases to paint on, on strainers), 'doecken zonder raemen' (canvases without strainers), 'doecken mede gespannen en begonnen te schilderen' (canvases stretched and begun to be painted), 'doecken gepleumeerd' (or: 'geplumuert', 'geprumiert', 'gepluymeert': primed canvases), 'doecken bereyt' (prepared canvases). Those canvases where the priming is not explicitly mentioned were probably primed as they are mentioned in the plural, having already been cut from a bolt. Where strainers are not mentioned the canvases may or may not have been stretched. In Peter Lely's inventory many loose, i.e. unstretched, canvases are listed as well as stretched ones; 'straining frames' without canvases are mentioned there as well (cf. M.K. Talley,* op. cit. *note 33).*

65 *A document from 1659 (Rembrandt doc., 1659/18) mentions a double portrait by Rembrandt painted around 1642, the sitter for which, Abraham van Wilmerdonx, states that he paid 500 guilders for the painting and a further 60 guilders for the canvas and frame ('heeft betaelt gehadt, de somme van vijfhon- dert gulden wegen het schilderen en noch de somme van tsestigh gulden daerenboven voor t doek en lijst').The invoice dated 30 July 1661 for the Alexander sent to Antonio Ruffo contained as a separate item 'per la tela di do Alessandro ed Homero f18' (for the canvas of the said Alexander and Homer) (Rembrandt doc., 1661/5).*

66 *H. von Sonnenburg,* op. cit. *(note 13), p. 159 and p. 176 note 6.*

67 *Leendert Hendricx Volmarijn's request of 1643 to the Leyden Municipality, mentioned earlier (Chapter II, note 4), gives the impression that much more of the preparation of painting materials was done outside the painter's studio than is generally thought. He intended to sell 'various prepared and unprepared paints, panels, canvases, brushes and all other tools useful and necessary for the art of painting' ('allerley geprepareerde en ongepre- pareerde verwen, panden, doucken, pincelen ende alle andere gereetschappen tot de schilder- conste dienstig ende van noden'). See also Henny,* op. cit. *(note 38).*

68 *See note 59.*

69 *Six paintings in the Gouda Stedelijk Museum 'Het Catharina-Gasthuis' (on loan from the Oud-Katholieke Kerk in Gouda); Pieter Claesz. Soutman's Officers of the Cloveniersdoelen, Haarlem, Frans Halsmuseum (inv. no. 3. 13); Gerard van Honthorst's King David Playing the Harp, Utrecht, Centraal Museum, cat. no. 149, Honthorst's scene with a paintress at work, Margaretha de Roodere (16..-1666), Wife of Reynier van Heemskerk, and an Elderly Woman, State-owned Art Collections Department, no. c313, currently in the Centraal Museum, Utrecht. Most of the paintings on canvas in the Oranjezaal at Huis ten Bosch are still in their original condition (kind communication from B. Brenninkmeyer-de Rooij).*

70 *Cf. Studio scenes by Dou and his school, Gabriel Metsu, Jan Miense Molenaer, Jan Steen, Jacob van Spreeuwen, Joost Cornelisz. Droochsloot, Hendrik Pot, Vincent van der Vinne and others show canvases stretched in various ways. Cf. W. Martin, Gerard Dou, Stuttgart-Berlin, 1913 (Kl. d. K.), pp. 12, 13, 57, 58, 59, 83; W. Martin, 'The life of a Dutch artist in the seventeenth century', Burl. Mag. 7 (1905), p. 129; 8 (1905-06), pp. 19, 22; 'How a Dutch picture was painted', Burl. Mag. 10 (1906-07), p. 151; Knut Nicolaus,* op cit. *note 10, fig. 45; W. Martin, 'De Jan Steen-tentoon- stelling te Londen', Onze Kunst 16 (1909), p. 140; H.E. van G(elder), 'Een schilder aan de arbeid', Mededelingen van de dienst voor kun- sten en wetenschappen der Gemeente 's-Gravenhage 4 (1937), pp. 71, 72; Städelsches Kunstinstitut Verzeichnis der Gemälde aus dem Besitz des Städelschen Kunstinstituts und der Stadt Frankfurt, Frankfurt a.M. 1966, fig. 57; G. Muller, 'The Perseus and Andromeda on Rubens's house', Simiolus 12 (1981-82), pp. 131-146, esp. figs. 1, 4, 22 and 23.*

71 *As far as we know, no Dutch written source describes the stretching of canvas. The earliest known text on the subject is by Cennino <303/>Cennini, The Craftsman's Handbook, Dover reprint of D.V. Thompson's translation of 1933, p. 103. The exact interpretation of the original text is however not without problems, as Mr B. Skans and Mr B. Lindberg from the University of Lund, kindly pointed out in a letter dated 21 June 1983. In the same letter they drew our attention to an early Swedish source, a text dealing with block-printing that was either written or translated from an unknown Italian text by the monk Peder Månsson, who died in 1534 as bishop of Västerås (cf. R. Geete, Peder Månssons skrifter på Svenska, Stockholm 1913-15, p. 545; John Granlund 'Peder Månssons skrifter', Kultur- historiskt lexikon för nordisk medeltid, 13, Malmö 1968, col. 156). It describes the stretching of banners to be block-printed and painted. De Mayerne Ms. p. 141, ed. Berger op. cit. (note 27), p. 312, mentions a device to stretch canvases to be restored, and (Ms. p. 99, edn. Berger p. 276) one for the stretching of textiles to be painted on other than canvas. H. von Sonnenburg, op. cit. (note 13), p. 176 note 5 mentions a detailed description of the stretching of canvas in Antonio Palomino, El Museo Pictorico y Excala Optica, Madrid 1715-24, ed. Aguilar, Madrid 1947, p. 482.*

72 a1482*In the case of primary cusping, the deformation decreases so gradually that it is impossible to tell exactly where it is no longer visible. The measurements given here have to be seen as approximative.*

73 *In a number of paintings produced between 1631 and 1634 primary cusping is missing without sufficient reason to assume a later reduction, or there is only what with reasonable probability can be considered to be secondary cusping. This is for instance the case along one long side of the Portrait of a Man at a Writing-Desk, Leningrad (Br. 146), the Portrait of Joris de Caullery, San Francisco (Br. 170), A Young Woman at her Toilet, Ottawa (Br. 494); along both long sides of the Portrait of a Man (Br. 167), the Portrait of a Woman (Br. 331), both in New York; along one short side of the Portrait of a Man Rising from his Chair, Cincinnati, Taft Museum (Br. 172), the Portrait of a Woman in an Armchair, New York (Br. 341), the Portrait of a Man, Kassel (Br. 171) (which may also have been reduced later), the Portrait of the Minister Johannes Wtenbogaert, Rijksmuseum Amsterdam (Br. 173) and the Flora, Leningrad (Br. 102).*

74 *Peder Månsson, ed. R. Geete,* op. cit. *(note 71), p. 545.*

75 *According to Brachert,* op. cit. *(note 11), p. 34, the stretcher with wedge-shaped keys was introduced between 1753 and 1757.*

76 *When applying the ground to a canvas stretched in such a way that it rests on the battens of the stretcher, defects in the ground layer or even damage to the canvas could be caused by the pressure of the priming knife. See, however, fig. 168.*

77 *Besides iron nails, wooden pegs were also used to attach the canvas to the stretcher (information kindly provided by Hans Böhm, Berlin, based on a work by Emanuel de Witte; see also K. Nicolaus, op. cit., note 10, p. 39).*

78 *See note 69.*

79 *This appears to have been the most common practice during the seventeenth century. One may conclude this from a document, dated 4 December 1647, concerning the supply of 30 prepared canvases for the Oranje Huis ten Bosch, together with their stretchers, 'met gem. doecken daer op gespannen en vast gemaekt naer behooren' (the canvases mentioned stretched thereon and attached in the proper way; see J.G. van Gelder in: N.K.J. 1948-49, pp. 121-122). During an assessment of the condition of the paintings in the Oranje Zaal in 1997 it was found that the majority of the canvases is stretched in the way described on p. 120.*

80 *The depth of these deformations is presumably related to the type of preparation applied to the canvas and the period of time that elapsed between priming and restretching. Even when the weave deformation does not extend far inwards, the deformation along the edge may be just as prominent as that near the primary stretching holes, or even more so (cf. figs. 152 and 157).*

81 *The distances between the holes in the canvas differ from painting to painting, and are not even uniform in one and the same canvas. The lacing threads were obviously basted at only approximately equal distances.*

82 *Along the top edge of the Portrait of a Man, Kassel (Br. 171) the original edge of the canvas has been well preserved, and is at present only slighty folded, together with the lining canvas, over the stretching bar. In the case of the Kassel Jacob Blessing the Sons of Joseph (Br. 525) the top and bottom edges are in their original condition (fastened to a lining canvas) without showing traces of ever having been pulled around stretcher bars. See fig. 156.*

83 *Of these four only one is still in its original state – the anonymous Portrait of Dirck Hen- dricksz. van Swieten of 1626 in the Rijksmuseum, Amsterdam (inv. no. C 1528, on loan from the Koninklijk Oudheidkundig Genootschap) (see fig. 157) The other three, where a modern stretcher has replaced the original lacing system though the holes in the frames still survive, are Hendrick Goltzius' Hercules and Cacus, Mercury and Minerva in the Frans Hals Museum, Haarlem (nos. 470-472, on loan from the Mauritshuis, The Hague). All four are illustrated in P.J.J. van Thiel en C.J. Bruyn*

Kops, Prijst de lijst. De Hollandse schiderijlijst in de zeventiende eeuw, Amsterdam 1984, exhib. cat. Rijksmuseum, nos. 11 and 6.

84 *In the greater part of the Gouda paintings mentioned in note 69 the seams are made by sewing the selvedges of the canvases together without turning the fabric back. This method has been described by Antonio Palomino,* op. cit. *(note 71), p. 482.*

85 We owe this information to Mr C.A. Burgers, Rijksmuseum. The fact that such a standard strip was current throughout Europe is documented by the fact that with paintings by Tintoretto and many other Venetian paintings as well as a painting by Murillo the same stripwidth was encountered; cf. J. Plesters and L. Lazzarini, op. cit. (note 13), p. 154; H. von Sonnenburg, op. cit. (note 13), p. 159.

86 *See note 36.*

87 *See notes 32, 36.*

88 *In Antwerp inventories published by J. Denucé, Kunstuitvoer in de 17de eeuw te Antwerpen. De firma Forchoudt, Antwerpen 1931, frequent use is made of terms such as 'cartierdoecken', 'half- doecken', 'enkeldoecken', 'dobbeldoecken' etc. (see pp. 28, 29, 51, 76, 79, 98). Some of these correspond to those found in a sketch by George Vertue from c. 1730/34, see Talley,* op. cit. *(note 40), fig. 20. In the Northern Netherlands the terms used for canvases of a number of standard sizes were identical with those used for panels, and mostly referred to coins or amounts of money. See also chapter II, note 6 and 7 on the connection between standard panel sizes and frame sizes; cf. A Bredius, Kunstler-Inventare, esp. I pp. 334343, V p. 1656).*

89 a1500*Boot,* op. cit. *(note 31), p. 37.*

90 *Rembrandt doc., 1662/11 and 12. Rembrandt's Alexander has vanished; it probably was destroyed in a fire.*

91 *Cf. Amsterdamsche Courant, 8 September 1739 (Gemeente Archief, Amsterdam, 1032): 'Jan de Vries maeckt bekend, dat bij hem te bekomen is allerley soorten van geplemeert solder en schilderdoeck, van 1 tot 6 el breet zonder naet daer in uyt een stuck' (Jan de Vries offers for sale various kinds of primed ceiling or painting canvas, 1 to 6 ells wide without any seam in one piece). Kind communication from Mrs K. Levy.*

92 *Volpato Ms, M.P. Merrifield (ed.) Original Treatises on the Arts of Painting, New York 1967, 1st ed. London 1849, p. 728/729.*

93 *See M.W. Ainsworth, J. Brealey, E. Haverkamp-Begemann, P. Meyers, 'Paintings by Van Dyck, Vermeer, and Rembrandt reconsidered through autoradiography', in: Art and Autoradiography: Insights into the Genesis of Paintings by Rembrandt, Van Dyck, and Vermeer, New York (The Metropolitan Museum of Art) 1982, esp. p. 27 and note 34.*

94 *J. Plesters, 'Photomicrographs of Cross-Sections of Paint and Ground Samples' in 'The Ground in Pictures', Museum 21 (1968), pp. 245-276.*

95 *Van Mander, Levens, fol. 216 verso, in his life of Jheronimus Bosch: 'Hy hadde oock als meer ander oude Meesters de maniere, zijn dinghen te teeckenen en trecken op het wit der Pennelen, en daer over een doorschijnigh carnatiach- tigh primuersel te legghen en liet oock dickwils de gronden mede wercken' (Like other old masters, it was his manner to design and draw on the white of the panels and to lay over this a translucent, carnation toned 'primuersel' and he often let the grounds show through).*

96 *The difference in price that existed between lead white and ochres is illustrated by valuations found in inventories. In the estate of Trijntge Pieters described on 12 March 1648 (Municipal Archives, Rotterdam, Weeskamer boedel 430) 246 pound of brown ochre is valued at 8 guilders 12 stuivers, 28 pound of lead white at 4 guilders. In an estate at Dordrecht in 1667 (Municipal Archives, Dordrecht, not. A. de Haen, N.A. no. 20/224, fol. 114), yellow ochre is described as costing 5 guilders per 100 pound, lead white 14¾ guilders per 100 pound. Kind communication from Koos Levy.*

[H2] CHAPTER VI

This chapter is dedicated to my former teacher Josua Bruyn. It was first published in a slightly different form in Dutch in O.H. 107 nr. 1 (1993), pp. 137-151 and in abbreviated version in the preprints of Historical Painting Techniques, Materials, and Studio Practice. Leiden 1995, pp. 196-203.

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1 *Jozef Israëls, 'Rembrandt', De Gids 3 (1906), pp. 1-13, esp. 7.*

2 *See documentation about Jozef Israëls in the Rijksbureau voor Kunsthistorische Documentatie, The Hague.*

3 *The lithograph by Johan Braakensiek reproduced in fig. 172 was originally published in Bijvoegsel van de Amsterdammer. Weekblad voor Nederland of January 27, 1895.*

4 *Jozef Israëls,* op. cit. *(note 1), p. 7.*

5 *J. Veth,* op. cit. *(note 2).*

6 *J. Morrison, 'Sir George Reid in Holland: His work with G. A. Mollinger and Josef Israels', Jong Holland 4 (1991), p. 24.*

7 *Alois Riegl, Stilfragen, Berlin 1893, pp. V-XIX.*

8 Gottfried Semper, *Der Stil den technischen und tektonischen Künsten*, Frankfurt a.M. 1860/63, Viollet-le-Duc, Entretiens sur l'architecture, Paris 1863-1872.

9 *Alois Riegl, Die spätrömische Kunstindustrie nach den Funden in Österreich-Ungarn, edn. used Vienna 1927, p. 9. See also Alois Riegl, 'Naturwerk und Kunstwerk I', Allgemeine Zeitung, Munich, Beilage 13, 1901, edn. used Gesammelte Aufsätze, Augsburg/Vienna 1928, pp. 51-64, esp. 51-53.*

10 *Uta Bernsmeier, Die Nova Reperta des Jan van der Straet. Ein Beitrag zur Problemgeschichte der Entdeckungen und Erfindungen im 16. Jahrhundert, (dissertation) Hamburg 1986, pp. 13-15.*

11 *Giovanni Battista Volpato, 'Modo da tener nel dipingere', ed. Mrs. Mary P. Merrifield in Original Treatises on the Arts of Painting, New York 1967 (first edition 1849), pp. 726-755, esp. pp. 746-48.*

12 *It is not clear when paint was first conserved in pouches made of pig's bladder. In the Volpato Ms. from c. 1680,* op. cit. *(note 11), pp. 740-741, this practice is mentioned explicitly. According to Gettens and Stout, Painting Materials, New York 1942, p. 138, the metal tube became widely used around 1840.*

13 *This supposition is based upon an investigation of c. 50 paintings from 1400 to 1800 which have painted palettes depicted on them. Notations on this investigation have been incorporated in the system upon historical technological resources from the Netherlands Institute for Cultural Heritage, Amsterdam.*

14 *See also Colyn de Coter, Lucas Painting the Madonna, Germanisches National Museum Nürnberg, 1487; unknown Flemish master, Lucas Painting the Madonna, the Grimani Bre- varium fol. 781 verso, Bibliotheca Marciana, Venice.*

15 *See also Hindrik Bornemann, Lucas Painting the Madonna, Hamburg, Jakobikerk, 1499; School of Quiten Massys, Lucas Painting the Madonna, National Gallery London, Derick Baegert, Lucas Painting the Madonna, Landesmuseum Münster, 1490. To the same category of palettes belong: Jacob van Oostzanen, SelfPortrait of the Artist Working on a Portrait of his Wife, Museum of Art Toledo, c. 1530; Catharina van Hemessen, Self-Portrait, Öffentliche Kunstsammlung Basel, c. 1548.*

16 *Le Brun, pp. 770-771.*

17 *The Mayerne Manuscript, ed. Ernst Berger, Quellen für Maltechnik während der Renaissance und deren Folgezeit (XVI-XVII Jahrhundert), IV, p. 288-89.*

18 a1527*Mayerne,* op. cit. *(note 17), p. 255; see also Francisco Pacheo, Arte de la Pintura, Su Antiguedad y Grandesa, Sevilla 1649, edited and translated by Zalura Veliz in: Artists' Techniques in Golden Age Spain, Cambridge University Press 1986, p. 44.*

19 *P. Bautier, 'Les tableaux de singeries attribués a Teniers', Annales de la Société Royale d'Archéologie de Bruxelles XXXII (1926).*

20 *Wilhelmus Beurs, De Groote Waereld in 't kleen geschildert, Amsterdam 1698.*

21 *Simon Eikelenberg (1663-1738) originally was a brush merchant. The Eikelenberg-manuscript with rich information on technical aspects of painting is in the Municipal Archives of Alk- maar. It is being edited by Truusje Goedings.*

22 *Beurs,* op. cit. *(note 20), pp. 115-116: 'Het goud zonder het uit de mijnen te doen voort- koomen, werd aangelegt met rusgeel en gediept met gebranden omber, men doet 'er ook zomtijds wel een weinig lak by, en men hoogt het op met koningsgeel of masticot, en zoo heeft 'er het gezigte omtrent het zelve aan als aan 't waare gout, gelijk daar de gierigaarts geen ander gebruik van en hebben, en veel meer zorgen om 't te bewaaren.'*

23 *Beurs,* op. cit. *(note 20), pp. 165-166: 'Een wit paard. Dit schildert men op den dag met wit, ligten oker en swart, en op 't hoogzel met enkel wit: de tusschenkoleur recommandeert den ligten oker, en gebied het wit wat te menageeren: tot de schaduwe moet swart en ligten oker zijn met een weimig wit vermengt: reflexie onder de buik moet meest ligten oker hebben, 't swart en wit gemenageert wordende. De hoornen van de voeten schildertmen zomtijds met swart, wit, en ligten oker, en een weinig vermilioen; zomtijds ook met swart wit en omber.'*

24 *See for instance the Volpato Ms., see note 12.*

25 *Beurs,* op. cit. *(note 20), pp. 184-187.*

26 *The De Mayerne (ed. Berger),* op. cit. *(note 24), p. 289.*

27 *Beurs,* op. cit. *(note 20), p. 184: 'Gelijk wy menschen ons zelven het voornaamste der dieren stellen; zoo mede van de schilderkonst, en 't was die tot het toppunt verheeven te zien, als 'er een Schilder was, die alle verscheident- heid der verwen, en kragtige kolorijten, die in menschen vlees, en met namen in de tronien voorkomen, 't zywe de verscheide menschen besien, of haare verscheide hertstogten, behoorlijk genoeg in alle doorwrogtheid kan uitbeelden.'*

28 *Beurs,* op. cit. *(note 20), pp. 186.*

29 *Le Brun, pp. 770-771.*

30 *Beurs,* op. cit. *(note 20), pp. 187-190.*

31 *This uniformization of the processing qualities of the different colours paint is accomplished by the addition of fillers such as aluminium hydrate, or by the use of other pigments. Naples Yellow, for example, is substituted in this way by a mixture of titanium white and cadmium yellow.*

32 *See for example the specifications for the various pigments in a passage about oil-paint in: Anonymous, De volmaakte Verwer, Amsterdam 1770, appendix. In publications by Margriet van Eikema Hommes this aspect of oil-paint is viewed from different angles. Margriet H. van Eikema Hommes, 'A Proposal for the Classification of Painting Recipes', Preprints of the 11th Triennial Meeting of the icom Committee for Conservation, Edinburgh 1-6 sept. 1996, London 1996, vol. I, pp. 381-387; Margriet H. van Eikema Hommes Leids Kunsthistorisch Jaarboek 'The Painters' Anticipation on Colour Changes as Discussed in 17th-early 18th Century Sources on Painting Technique' 1997.*

33 *See for instance Wouter Kloek, 'Pieter Aertsen en het probleem van het samenstellen van zijn oeuvre', Nederlands Kunsthistorisch Jaarboek, vol. 40 (1989), pp. 1-27, esp. p. 18.*

34 *Maryan W. Ainsworth, J. Brealey, E. Haverkamp-Begemann, P. Meyers, 'Paintings by Van Dyck, Vermeer, and Rembrandt reconsidered through autoradiography', in: Art and Autoradiography, New York (The Metropolitan Museum of Art) 1982, pp. 9-99; see for the activities in the autoradiographic field of the Berlin Gemälde-Galerie and the Hahn-Meiter- Institut für Kernforschung in Berlin Maltech- nik/Restauro I, 1987, pp. 21 ff.*

35 *I owe this information to Karin Groen, who collected and analyzed hundreds of samples from paintings by Rembrandt collected in the context of the Rembrandt Research Project and the Neutron Activation Project mentioned in note 34.*

36 *Paul Taylor, 'The Concept of Houding in Dutch Art Theory', Journal of the Warburg and Courtauld Institutes lv (1992), pp. 210-232.*

37 *Jeroen Stumpel, The Province of Painting. Theories of Italian Renaissance Art, Utrecht 1990, pp. 131-174; see also Simiolus, vol. 19 (1989), nr. 3/4, pp. 219-243.*

38 *Willem Goeree, Inleyding tot d'Algemeene Teykenkonst, Middelburg 1670 (first edition 1668), pp. 128-9: '...dat gene, welk alles dat in een Teikening of Schilderye verbond word, doet agter en voor uyt wijken, en alles van het voorste tot het middelste, en van daar tot het agterste, op sijn eigen plaats doet staan, sonder nader of verder te schijnen, noch ligter of donkerder te vertoonen, als sijn verheid of nabyheid toelaat; invoegen yeder ding, sonder verwerring, los en wel uyt andere die'er nevens en ontrent zijn, en op sijn eigen stant- plaats, soo wel van grootte als van koleur, ligt en schaduwe gehouden blijft; ja datmen de tussen-ruimte van de plaats, of distantie die tussen yder lichaam open en ledig is, van zig wijkende, of na zig toekomende natuurlijk met het oog, als of het met de voeten toegan- gelijk ware, kan naspeuren, en op sijn plaats geplant vinden: en dit noemt men Houdinge...' Translated by Paul Taylor*, op. cit. *(note 36).*

39 *Joachim von Sandrart, Teutsche Academie der Edlen Bau-, Bild- und Mahlerey-Künste, Neurenberg 1675, Part I, Book III, p. 85.*

[H2] NOTES CHAPTER VII

This chapter was first published in a slightly different form in Exhib. Cat. 1991/92, pp. 12-39. My thanks go to Rudolf Evenhuis and the students in my seminar group on the rendering of texture in seventeenth-century painting at the Art History Institute of the University of Amsterdam. I drew great inspiration from the work of Gridley McKim-Smith (see note 27) and Ernst Gombrich (notes 21, 37, 39). I am indebted to the following for their valuable comments and suggestions during the writing of this chapter: J. Bruyn, B. Haak, P.J.J. van Thiel, M. Franken, P. Broekhoff, H. Miedema, K. Reichenfeld, Sally Salvesen and the translator Michael Hoyle. I am particularly grateful to Karin van Nes for her secretarial assistance, and to René Gerritsen, who took the detail photographs.

1 a1551*Anton Kerssemakers in De Amsterdammer, Weekblad voor Nederland, 14 April 1912, p. 6; see The Complete Letters of Vincent van Gogh, 3 Vols., Greenwich (Conn.)/London 1958, Vol. II, p. 446.*⏎

2 *Eduard Kolloff, 'Rembrandt's Leben und Werke nach neuen Actenstücken und Gesichtspunkten geschildert', in Historisches Taschenbuch, ed. Friedrich Raumer, 3rd series, Vol. V, Leipzig 1854, quoted from the facsimile reprint edited by Christian Tümpel and published by the Deutsches Bibel-Archiv, Hamburg 1971, pp. 401-582, esp. p. 539: 'Sehr genaue Kenner und Liebhaber, die Alles mit dem Vergrösserungsglase untersuchen, werden durch seine Malerei aus dem Concepte gebracht und in Verlegenheit gesezt; sie können nicht angeben, wie sie gemacht ist, und wissen sich nicht anders zu helfen als mit der Erklärung, das hermetisch versiegelte Machwerk seiner Bilder sei eine Zauberei und der Maler selbst habe keine klare Erkenntniss davon gehabt.'*⏎

3 *L. Gans, 'De mythe van Karel Appel's "Anrotzooien"', in Album Discipulorum J.G. van Gelder, Utrecht 1963, p. 179 ff., esp. p. 182.*⏎

4 *Lairesse, Bk. V, p. 324: 'met kloeke hand' [...] 'evenwel niet op zyn Rembrands of Lievensz., dat het sap gelyk drek langs het Stuk neêr loope. [...] 'maar gelijk en mals [zodat] uwe voorwerpen alleen door de Konst rond en verheeven schynen en niet door kladdery'.*⏎

5 *Letter 426 of 10 or 11 October 1885; see Complete Letters,* op. cit. *(note 1), Vol. II, p. 417.*⏎

6 *See Eric J. Sluijter et al., exhib. cat. Leidse fijn- schilders; van Gerrit Dou tot Frans van Mieris de Jonge 1630-1760, Leiden (Stedelijk Museum de Lakenhal) 1988, and Peter Hecht, exhib. cat. Amsterdam (Rijksmuseum) 1989.*⏎

7 *J.A. Emmens, 'Natuur, onderwijzing en oefe- ning' in Album Discipulorum J.G. van Gelder, Utrecht 1963, pp. 125-36; idem, Rembrandt en de regels van de kunst, Utrecht 1964 (diss.).*⏎

8 *Felix Timmermans, Pieter Brueghel; Zo heb ik u uit uwe werken geroken, Amsterdam 1927, quoted from the fourth impression, Amsterdam n.d., p. 189: 'Ge moet de borstelvegen zien: dat zijn de kronkelingen, de kreten van de ziel'.*

9 *Le Brun, pp. 766-848, esp. pp. 824-25: '3. Comme est il possible que le pinceau ait couché tant de douceurs sous ces traits si rudes, sous des couleurs si rudes, et que parmy tant de nonchalance, on ait couché tant d'attraits.'*

10 *E. de Jongh, review of B. Haak, Hollandse schilders in de Gouden Eeuw, Simiolus 15 (1985), p. 67.*

11 *Baldassare Castiglione, Il Libro del Cortegiano, Venice 1528, p. 18. The Dutch translation by Lambert van de Bos, De volmaeckte Hovelinck, van de graaf Baldassare de Castiglione, was published in Amsterdam in 1652. See also David R. Smith, ' "I Janus": Privacy and the gentlemanly Ideal in Rembrandt's Portraits of Jan Six', Art History 2 (1988), pp. 42-63.*

12 *Vasari, ed. Barocchi, Vol. VI, pp. 154-74.*

13 *Van Mander, Levens, fol. 174 verso-77 verso, see also idem, Den grondt der edel vry schilder- const, ed. Hessel Miedema, Utrecht 1973, Cap. XII, lines 22-26, pp. 258-61.*

14 Hoogstraten 1678, p. 234.

15 *Vasari, ed. Barocchi, p. 155, lines 24-38, p. 156, lines 1-6.*

16 *Rembrandt in his fifth letter to Constantijn Huygens, 27-1-1639; see Rembrandt doc., 1639/4, p. 167: '[...] dat men daer wijt ken afstaen'.*

17 *Houbraken, vol.I, p. 269: '[...] de menschen, als zy op zyn schilderkamer kwamen, en zyn werk van digteby wilden bekyken, te rug trok, zeggende: de reuk van de verf zou U verveelen'.*

18 *In his life of Aert de Gelder, Houbraken discusses the fact that the choice between the rough and the smooth manner was subject to fashion (Houbraken, vol. III, p. 206).*

19 *Max Doerner, Malmaterial und seine Verwendung im Bilde, Stuttgart 1960 (first ed. Stuttgart 1921), pp. 332-38.*

20 *Vasari, ed. Barocchi, p. 166, lines 30-31: '[...] di maniera che da presso non si possono vedere e di lontano appariscono perfette'.*

21 *Horatius, Ars Poetica, lines 361-62 'Ut pictura poesis: eritquae, si propius stes, te capiat magis, et quaedam, si longius abstes.' The English translation is from Horace, Satires, Epistles and Ars Poetica, trans. H. Rushton Fairclough, London and Cambridge (Mass.) 1947, p. 481. See also Ernst H. Gombrich, Art and Illusion, Oxford 1990 ed., pp. 161-69.*

22 *Nat. Hist. Bk. XXXV, xl, lines 143-46, pp. 365-67.*

23 *Marco Boschini, 'Le minere della pittura', Compandiosa informazione di Marco Boschini, non solo delle pitture pubbliche di Venezia, ma delle isole ancora circonvicine, Venice 1664, p. 119-20.*

24 *Houbraken, vol. I, p. 259: '[...] daar dingen ten uitersten in uitgevoert waren, en de rest als met een ruwe teerkwast zonder agt op tekenen te geven was aangesmeert. En in zulke doen was hy niet te verzetten, nemende tot verantwoording dat een stuk voldaan is als de meester zyn voornemen daar in bereikt heeft.'*

25 *Van Mander, Levens, fol. 176 verso, 177; idem, Grondt, Cap. XII, line 23.*

26 *Vasari, ed. Barocchi,* op. cit. *(note 12), p. 166, lines 32-36.*

27 *Gridley McKim-Smith, 'Writing and Painting in the Age of Velazquez', in: Gridley McKim- Smith et al., Examining Velazquez. New Haven/London 1988, pp. 1-33.*

28 *Joseph Gantner, Rembrandt und die Verwandlung klassischer Formen, Bern/Munich 1964; Kenneth Clark, Rembrandt and the Italian Renaissance, London 1966.*

29 *Vasari, ed. Barocchi, p. 155, lines 17-24 '... cominciò a dare alle sue opere più morbidezza e maggiore rilievo con bella maniera, usando nondimeno di cacciar sì avanti le cose vive e naturali, e di contrafarle quanto sapeva il meglio con i colori, e macchiarle con le tinte crude e dolce, secondo che il vivo mostrava, senza fa disegno, tenendo per fermo che il dipignere solo con i colori stessi, senz'altro studio di disegnare in carta, fusse il vero e miglior modo di fare et il vero disegno'. On the question of disegno and colorito see, for instance, David Rosand, Painting in cinquecento Venice: Titian, Veronese, Tintoretto, New Haven/London 1982, pp. 15-25.*

30 *Van Mander, Grondt, Cap. XII, line 5: '... dus [zij] die overvloedich in 't inventeren zijn, doen als de stoute en verbeteren hier en daer een foute'.*

31 a1582*McKim-Smith,* op. cit. *(note 27), p. 13; see also David Rosand, 'Titian and the critical Tradition', in idem (ed.), Titian, his World and his Legacy, New York 1982, pp. 1-39.*

32 *Houbraken, vol. I, p. 259: '[...I om ene enkele parel kracht te doen hebben, een schone Cleopatra zou hebben overtaant'.*

33 *Vasari, ed. Barocchi, p. 166, lines 33-38: '[...] e ciò adiviene perché, se bene a molti pare che elle siano fatte senza fatica, non è così il vero e s'ingannano, perché si conosce che sono rifatte, e che si è ritornato loro addosso con i colori tante volte che la fatica vi si vede. E questo modo sì fatto è giudizioso, bello e stupendo, perché fa parere vive le pitture e fatte con grande arte, nascondendo le fatiche.'*

34 *Rembrandt doc., 1656/12, No. 216, p. 371: 'Een seer groot boek met meest alle de wercken van Titian'. See the chapter 'Rembrandt and the Venetians' in Clark,* op. cit. *(note 28), pp. 101-45; and Broos 1977, p. 138 (Titian).*

35 *McKim-Smith,* op. cit. *(note 27), p. 24, and note 116 on pp. 137-38: '... de golpes de pincel groseros, casi como borrones al descuido ... respondió el Ticiano: Señor, yo desconfié de llegar a la delicadeza y primor del pincel de Micael Angelo, Urbino, Coreggio y Parmesano y que cuando bien llegase, sería estimado tras ellos, o tenido por imitador dellos'.*

36 *Houbraken, vol. I, p. 273.*

37 *Ernst H. Gombrich in 'Michael Podro in Conversation with Sir Ernst Gombrich', Apollo, December 1989, pp. 373-78, esp. p. 374.*

38 *Le Brun, pp. 824-27.*

39 *'Light, Form and Texture in FifteenthCentury Painting North and South of the Alps', in: Ernst H. Gombrich, The Heritage of Apelles, pp. 19-35, esp. p. 32.*

40 *Gombrich,* op. cit. *(note 21); idem,* op. cit. *(note 39).*

41 *Gombrich,* op. cit. *(note 21), p. 99.*

42 *Systematic discussions of the rendering of different materials were mainly to be found in manuals on watercolour painting written for amateurs, such as Gerard ter Brugghen, Verlichtery Kunst-Boeck, Amsterdam 1616, and W. Beurs, De Groote Waereld in 't kleen geschildert, Amsterdam 1692, which also gives instructions for the painter in oils. In other sources, too, such as the De Mayerne manuscript and Gerard de Lairesse's Groot Schilderboeck, one finds incidental hints on the representation of various materials (see also Chapter VI).*

43 *Cennino Cennini, Il Libro dell'Arte, c. 1390, Ch. CXL; see The Craftsman's Handbook, trans. Daniel V. Thompson, New Haven 1933, Dover reprint p. 90.*

44 *Huygens, pp. 84-90.*

45 *Jan Jansz. Orlers, Beschrijvinge der stadt Leyden, Leiden 1641. Cf. exhib. cat. Jan Lievens, ein Maler im Schatten Rembrandts, Braunschweig (Herzog Anton Ulrich-Museum) 1979, p. 35.*

46 *Hoogstraten, p. 238: 'In d'aengesmeerde ver- wen, vernissen en olyen wonderen te zoeken, was Jan Lievens dapper t'huis.'*

47 *H.L.M. Defoer, 'Rembrandt van Rijn, De Doop van de Kamerling', O.H. 91 (1977), pp. 2-26, esp. p. 8; Van de Wetering 1976-77, pp. 21-31, esp. p. 29.*

48 *Joachim von Sandrart, Teutsche Academie der Edlen Bau- Bild- und Mahlerey Künste, ed. A. Peltzer, Munich 1925, p. 196.*

49 *The documents on Samuel van Hoogstraten have been published by: Michiel Roscam Abbing, De schilder & schrijver Samuel van Hoogstraten 1627-1678, Eigentijdse bronnen & oeuvre van gesigneerde schilderijen, Leiden 1993.*

50 *Van Mander, Levens, Fols. 174 verso-177 verso; Junius, De pictura veterum, Amsterdam 1637, of which the Dutch translation was published in Middelburg in 1641 (De schilderkonst der oude begrepen in drie boeken), three years after Junius's own English translation, The Painting of the Ancients, London 1638.*

51 *Hoogstraten, p. 176.*

52 *Heinrich Wölfflin, Kunstgeschichtliche Grundbegriffe, Munich 1915; English edition: Principles of Art History, trans. M.D. Hottinger, New York 1932.*

53 *Konrad Fiedler, Schriften zur Kunst (ed. Gottfried Boehm), Munich 1971, p. lvii.*

54 *Hoogstraten, pp. 306-309: 'Van voorkoming, wegwijking en verkorting'. The original Dutch of the quotations in the following paragraphs is as follows: '[...] dat uw papier, hoe plaetse, daer gy wilt, 't welk gy in 't gladde blaeuw des Hemels niet doen en kunt'; 'Ik zeg dan, dat alleen de kenlijkheyt de dingen naby doet schijnen te zijn, en daer en tegen de ega- elheyt de dingen doet wechwijken: daerom wil ik, dat men 'tgeen voorkomt rul en wakker aensmeere, en 'tgeen weg zal wijken, hoe verder en verder, netter en zuiverder handele. Noch deeze noch geene verwe zal uw werk doen voorkomen of wechwijken maar alleen de kenlijkheyt of onkenlijkheyt der deelen'; '[...] blindheyd [die] tot deze tijden noch zoo groot [is] geweest'; '[...] nochthans het witte altijt naerder, en het zwarte verder af te schijnen te zijn [...] dat de verdiepte holligheyd van [...] een put [...] of een gracht'; and 'Het schijnt dat de locht zelf in een kleine wijtte een lichaem maekt, en zich met Hemel verwe bekleed'.*

55 *Gombrich,* op. cit. *(note 39), pp. 3-18.*

56 *A painting in which Hoogstraten evidently applied the principles concerning 'kenlijkheyt' is: Old Man at a Window, 1653, canvas 112 x 88 cm, Kunsthistorisches Museum, Vienna, inv. no. 1282.*

57 *Philostratus, Imagines, London/Cambridge (Mass.) 1979, Bk. I, Ch. 13, p. 57.*

58 *Lairesse, vol. I, p. 14: '[...] een bekwame en vogtige grond achter de Beelden om den ui- terste omtrek daarin te doen verdwynen'.*

59 *Vasari, ed. Barocchi,* op. cit. *(note 12), p. 164, line 24 '[...] avendo egli bellissimo spirito et una molto e vaga e visace maniera'.*

60 *'Journal du Voyage du Cavalier Bernin en France par M. de Chantelou', manuscrit inédit publié et annoté par M. Ludovic Lalanne, Gazette des Beaux Arts 15 (1877) – 32 (1885), esp. 26, 2e période (1882), p. 534: '2 octobre 1665. [...] qu'au contraire les practiciens comme Tintoret, Paul Véronèse et quelques modernes s'étaient abandonnés à une franchise ou furie de peindre'. See also Paul Fréart de Chantelou, Diary of the Cavaliere Bernini's Visit to France, edited and with an introduction by Anthony Blunt, Princeton 1985, p. 246.*

61 Joshua Reynolds, Discourses on Art, 1769-1790, ed. Robert R. Wark, New Haven/London p. 223.⏎

[H2] A1614NOTES CHAPTER VIII

The passages in this chapter about Rembrandt's technique in the Night Watch are based on: E. van de Wetering, C. M. Groen and J. A. Mosk, 'Summary report on the results of the technical examination of Rembrandt's Night Watch', Bulletin van het Rijksmuseum 24 (1976), pp. 69-98. I am greatly indebted to Diederik Paauwe for his assistence while writing this chapter.

1 *Max Doerner, Malmaterial und seine Verwendung im Bilde, (first ed. Stuttgart 1921). I made use of the 11th edition, Stuttgart 1960.English translation by Eugen Neuhaus, 1934 The materials of the artist and their use in painting: with notes on the techniques of the old masters. Revised ed. London: Hart-Davis, 1969.*

2 *P. Brinkman, Het geheim van Van Eyck: aan- tekeningen bij de uitvinding van het olieverven, Zwolle 1993.*

3 *Doerner,* op. cit. *(note 1), pp. 332-338.*

4 *Doerner,* op. cit. *(note 1), pp. 334-336*

5 *Schendel, A. van en H.H. Mertens, O.H. 62 (1947), pp. 1-52, esp. p. 1, note 1, where they refer to: A.M. Hind, Rembrandt, 1938, p. 101 note.*

6 *A.P. Laurie, The Painter's Methods and Materials, New York 1967 (first ed. 1926), pp. 8, 131-132.*

7 *The issue of Bulletin van het Rijksmuseum 24, 1976, nr. 1 and 2 (in Dutch with English translation) is devoted to this event and the subsequent investigation and restoration of the painting.*

8 *Egbert Haverkamp-Begemann, Rembrandt. The Nightwatch, Princeton 1982, p. 7.*

9 *For the material history of the Night Watch, see A. van Schendel and H.H. Mertens, 'De restauraties van Rembrandts Nachtwacht' Oud Holland 62 (1947), pp. 1-52. A. van Schendel, 'Some Comments on the Cleaning of the Night Watch', Museum 3 (1950), pp. 220-222.*

10 E. van de Wetering, C.M. Groen en J.A. Mosk, 'Summary Report on the Technical Examination of Rembrandt's Night Watch', *Bulletin van het Rijksmuseum* 24, 1976, nos 1 and 2, pp. 68-98.

11 *Helmut Schweppe and Heinz Roosen-Runge, 'Carmine' in: Artists' Pigments, A Handbook of their History and Characteristics, (Robert L. Fel-ler, editor), New York 1986. Jo Kirby and Raymond White, 'The Identification of Red Lake Pigment Dyestuffs and a Discussion of their Use; National Gallery Technical Bulletin, vol. 17 (1996), pp. 56-80.*

12 *G. Glück, Niederländische Gemälde aus der Sammlung des Herrn Alexander Tritsch in Wien..., 1907, p. 18.*

13 *Doerner,* op. cit. *(note 1), p. 334: 'Durch dünne, halbdeckende und schimmernde Lasuren wurden über den grauen Kern der Untermalung die trennenden Lokalfarben aufgetragen, doch so, dass nie der Unterton in seiner Wirkung als gemeinsames Grau verlorenging (...)'*

14 *A blueish glazing was found in Br. 460; for a reproduction see Corpus I, p. 31, fig. 22.*

15 *Grey glazes were found in the faces of Br. 20 and Br. 48.*

16 *I. Jost, 'Bemerkungen zur Heinrichsgalerie des P.P. Rubens', Nederlands Kunsthistorisch Jaarboek 15 (1964), pp. 175-219; M. Jaffé, Rubens Cataloge Completo, Milano 1989.*

17 *Arnout Balis, '"Fatto da un mio discepolo", Rubens Studio Practices reviewed', in: exhib. cat. Rubens and his Workshop: The Flight of Lot and his Family from Sodom, Tokio 1994, pp. 97-127. See also my essay on this topic in Corpus vol. IV.*

18 *See Art in the Making, Table 2, p. 31.*

19 *H. von Sonnenburg, 'Technical Aspects: Scientific Examination', in: Rembrandt after Three Hundred Years: A Symposium, Chicago 1973, pp. 83-101, esp. p. 91.*

20 *Tümpel believes it was painted by an artist from Rembrandt's circle. Christian Tümpel, Rembrandt, Amsterdam/Antwerpen 1986, p. 40 nr. a99.*

21 *Houbraken I, p. 259.*

22 *Houbraken I, p. 258.*

23 *David Bomford, Christopher Brown, Ashok Roy, Art in the Making. Rembrandt, London 1988, Portrait of Jacob Trip, pp. 120-125.*

24 *The Rijksmuseum is planning to publish a bulletin on technical aspects of its collection. A detailed analysis of the investigation and restoration of the Anatomy Lesson of Dr Dey- man will be published in that bulletin, as well as in Corpus V.*

25 *Ben. 1175, cf. J.Q. van Regteren Altena,'...De Zoogenaamde voorstudie voor de Anatomische les van Dr. Deyman', O.H. 65 (1950), pp. 171-178. For the history of the Deyman, see Norbert Middeldorp, De anatomische les van dr. Deyman, Amsterdams Historisch Museum 1994.*

26 *See also Chapter II.*

27 *Carol Christensen e.a., 'Van Dyck's Painting Technique, his Writings, and Three Paintings in the National Gallery of Art', in exhib. cat. Anthony van Dyck, National Gallery of Art, Washington 1990/91, pp. 45-52; see esp. fig. 80.*

28 *An example of a traditionally used layered build-up to obtain a specific colour – a strong light greenish – can be found in two early paintings by Rembrandt, the Leiden History Piece (Br. 460, fig. 37) and the Musical Allegory (Br. 622, fig. 16). The green has a pink underlayer (see fig. 36). I found the same system applied in a Madonna with Child and Two Angels by Gerard David (Kunstmuseum Basel).*

29 *Michael Hirst, Jill Dunkerton, Making and Meaning. The Young Michelangelo, London 1995; see esp. fig. 36.*

[H2] NOTES CHAPTER IX

This chapter is based on the results of the project 'binding medium' carried out in a collaboration of the Rembrandt Research Project with dsm Research, coordinated by Karin Groen. My involvement with the Molart (Molecular Aspects of Ageing in Painted Works of Art) project, subsidized by nwo (The Netherlands Organization of Research) had an impact on the genesis of this chapter.

1 *C. L. Eastlake, Methods and Materials of Painting of the Great Schools and Masters, (2 vols. 1847), New York 1960, pp. 345-347.*

2 *M. Kirby Talley, Jr., 'All Good Pictures Crack: Sir Joshua Reynolds' Practice and Studio', Exhib. Cat. Reynolds, London 1986, pp. 55-70. Rica Jones of the Tate Gallery was kind enough to inform me that the painting of which a detail is reproduced in fig. 292 is in excellent condition, though covered with a discolored varnish.*

3 a1648*Jacques Maroger, The Secret Formulas and Techniques of the Masters, New York 1979, pp. 121-122.*

4 *Art in the Making, p. 31, table 2. John Mills and Raymond White, 'Paint Media Analyses, National Gallery Technical Bulletin' 13 (1989), pp. 69-71. Raymond White and Jennifer Pilic, 'Analyses of Paint Media', National Gallery Technical Bulletin, 14 (1993), pp. 86-94.Raymond White and Jo Kirby, 'Rembrandt and his Circle: Seventeenth-Century Dutch Paint Media, Re-examined', National Gallery Technical Bulletin, 15 (1994), pp. 64-78.*

5 *I owe the image of the violin bow in this context to Hayo de Boer.*

6 *Hoogstraten, p. 238. The word 'vernis' (lit. varnish) in historic sources was used in the wider sense to indicate a binding medium as well as a protective layer on the paint surface.*

7 *F.R. Eirich (ed.), Rheology, (5 vols.), New York 1956-69.*

8 *Catrien Steenbeek, during her internship in my department in the Central Research Laboratory of Art and Science in Amsterdam carried out much of this research. See also Renate Keller, 'Leinöl als Malmittel', Maltechnik 2, 1973, pp. 74-105.*

9 *K. Groen, 'An Investigation of the Use of Binding Medium by Rembrandt: Chemical Analyses and Rheology', Zeitschrift für Kunsttechnology und Konservierung 11 (1997), Heft 2 (forthcoming).*

10 *I thank Karin Groen and Eric Geladé for checking this excursion in analytical methods and rheological problems.*

11 *Giovanni Battista Volpato, 'Modo da tener nel dipingere', in: M.P. Merrifield (ed.), Original Treatises on the Arts of Painting, New York 1967 (first edition 1849), pp. 726-755, esp. p. 740/741.*

12 *P.W.F. Brinkman, Het geheim van Van Eyck: aantekeningen bij de uitvinding van het olieverven, Zwolle 1993; L. Kockaert, 'Note sur les émulsions des Primitifs Flamands', Bulletin IRPA- KIK XIV (1973/74), pp. 133-139; L. Kockaert and M. Verrier, 'Application des colorants à l'identification des liants de Van Eyck', Bulletin IRPA-KIK XVII (1978/79), pp. 122-127.*

13 *Karel Appel in a television interview in 1993 on the occasion of an exhibition of his work in the Gemeente Museum, The Hague.*

14 *Simon Eikelenberg, Aantekeningen over de schilderkunst, 1679-1704, p. 25: 'Om roode inckt te maken. Neemt 3 pinte regenwater met een half.. elke ongebluste kalck ende laet dat staen om de loogh te hebben ende des morgens soo gietet door eene doeck ende doeter in 2 loot bresilienhoudt en laetet half in sieden' t bresiliehout moet kleyn gestoote sijn alst dan half in gesooden is soo neemt ([doorgehaald]: een loot vant bese gomme van harse boome ende.t) een loot gestoote aluyn een loot gomme araby 2 loot vant beste gomme van karsebome ende doet het daer in ende latet same opsieden ende dan suldyt van bresielie afgiete ende tsal goet ende oprecht sijn.'*

15 *J.H. de Vlieger, 'Historische verfschetsen VII, De Oudhollandse methode om loodwit te maken', Verfkroniek 62 nr. 1, 1989, pp. 21-26; T. Goedings, 'Een zeventiende-eeuwse verklaring voor het woord schulpwit', IIC Nederland Mededelingenblad 6, 1989, pp. 7-12.*

16 *A project: 'Dispersion Rheology of Rembrandt's Paint' is carried out by Karin Groen under the guidance of Prof. Dr. R. van der Linde, Coating Technology at the Technical University Eindhoven.*

17 *The restorers Herman van Putten and Cornelia Peres in the discussion after a lecture by the author simultaneously hit upon the idea of this possible use of semi-dried lumps of paint for the impasto of the yellow sleeve in the Jewish Bride.*

18 *L. Masschelein-Kleiner, Ancient Binding Media, Varnishes and Adhesives, (English translation) Rome 1985, pp. 8-10.*

[H2] NOTES CHAPTER X

This chapter was originally written for a book dealing with the investigation and restoration of seven Amsterdam Rembrandts in 1989-'92, which the Rijksmuseum plans to publish in due time in one of a series of yearbooks on technical issues. In a shorter version the chapter was published in Dutch; see E. van de Wetering, 'Is een schoongemaakte Rembrandt een Rembrandt?', Radar, stand van zaken in de wetenschap 96 (1996), pp. 111-122.

1 *For a survey of cleaning controversies in England see: B. Wechsler, 'Cleaning Controversy: Zur Diskussion der Gemäldereinigung in England von 1946-1963', Zeitschrift für Kunsttechnologie und Konserviering 1 (1987), pp. 88-132.*

2 *Jan van Dijk, Kunst- en historiekundige beschrij- ving van alle schilderijen op het Stadhuis van Amsterdam, met beoordelingen en aanmerkingen over de stukken en korte levensbeschrijvingen van derzelver schilders, Amsterdam 1758 (2nd edition, 1st ed. published in 1756): '...wat is 'er niet een meenigte van oude Juweelen der Kunst, door broddelaars handen, men mag wel zeggen onkundige klaauwen bedorven, waar van wy noch kentekens in de Doelen vinden, die [bij het schoonmaken] zodanig verschuurt zyn, dat men de Paneelen zo wel door de daging [de belichte delen van de voorstelling] als door de schaduwe ziet doorschynen.'*

3 *See Chapter VIII, note 9.*

4 *Cleaning in this context means the removal of yellowed varnish.*

5 *Margriet H. van Eikema Hommes, 'A Proposal for the Classification of Painting Recipes', Preprints of the 11th Triennial Meeting of the icom Committee for Conservation, Edinburgh 1-6 sept. 1996, London 1996, vol. I, pp. 381387. Painterly methods to prevent colour changes discussed in 16th- to early 18th- century sources on oil painting technique, Leids Kunsthistorisch Jaarboek (to be published in 1997).*

6 *Joseph Addison, 'A Dream of Painters', The Spectator (5 June 1711); see also G. Klotz, 'Hogarth und Addison', Zeitschrift für Kunstgeschichte XXII (1959), pp. 102 ff.*

7 *Hoogstraten, p. 218: 'Ik kon my naeuwelijx zonder lachen houden, als zeker gewaent goet kopyist my laetst zijn kunst toonde, welke hierin bestont, dat hy in 't kopieeren van oude eenichzins verdorven schilderyen, de berookt- heyt, schimmel en versterving hadt naegevolgt, jae beter als de rest van tgeen er nog goedt in was. Hy bedriegt zich zelven, die met zulk een nae-aeping der outheyt onkundigen poogt te bedriegen...'*

8 *Eco Haitsma Mulier, 'De achttiende eeuw als <310/>eeuw van het historisch besef', De achttiende Eeuw 26 (1994) 2, 147-152 esp. 149;P.B.M. Blaas, 'Historische tijd. Querelle en historisch besef', in: idem, Anachronisme en historisch besef. Momenten uit de historie van het Europees bewustzijn, Rotterdam 1988, pp. 16-31.*

9 a1674*Among the paintings Rembrandt must have worked on with long intervals are Susannah and the Elders, Berlin (Br. 516) and Danaë, St. Petersburg (Br. 474).Paintings he continued to work on after they had already been copied or paraphrased by members of his studio are The Blinding of Samson, Frankfurt (Br. 501), The Adoration of the Shepherds, Munich (Br. 574), Joseph and the Wife of Potifar, Berlin (Br. 524).*

10 *P.F.J.M. Hermesdorf, J. Giltay, E. van de Wetering, 'Enkele gegevens over Rembrandts "De eendracht van het land"', O.H. 100 (1986), pp. 35-49. The cross-sections with varnish layer are preserved in the Netherlands Institute for Cultural Heritage, Amsterdam.*

11 *Robert L. Feller, On Picture Varnishes and their Solvents, Obelin 1959. Revised ed. 1971. See esp. the chapter by Nathan Stolow: 'Solvent action: some fundamental researches into the picture-cleaning problem', pp. 45-116.*

12 *Gerry Hedly, 'Long lost relations and new found relativities: issues in the cleaning of paintings', in: idem, Measured Opinions, Collected Papers on the Conservation of Paintings, Caroline Villers (ed.), London 1993, pp. 172-178.*

13 *'Mij heer hangt dit stuck op een starck licht en dat men daer wijt ken afstaen soo salt best voncken'. Rembrandt Doc. 1639/4.The last crucial word, 'voncken,' was interpreted erroneously in the past as 'vouchen', which means: to fit (see H. Gerson, Seven Letters by Rembrandt, The Hague 1961, p. 55).*

14 *Rob Ruurs, 'Matt oder Glänzend?' Maltechnik/ Restauro 89/3 (1983), pp. 169-74, reprinted in ica Newsletter (Obelin, Ohio: Intermuseum Conservation Association) 16/1 (November 1985), pp. 1-6.*

15 *Hoogstraten, pp. 305-306.*

16 *Keith Aldrich, Phillip Fehl, Riana Fehl (eds.), The Literature of Classical Art, De Pictura Veterum, (according to the English translation 1638), Berkeley/Los Angeles/Oxford 1991, Vol. I, p. 243.*

17 *Hoogstraten, p. 305: 'de harde aaneenstooting van licht en bruin [donker] berispt', 'wel schaekberden [schaakborden] gelijken'. 'Vorder wil hy [Junius], dat men de macht van schaduwen matich gebruike.'*

18 *Hoogstraten, pp. 305-6: 'Daerom beveele ik u [aan] niet te veel met lichten en schaduwen door een te haspelen, maer de zelve bequame- lijk in groepen te vereenigen; laet uwe sterkste lichten met minder lichten minlijk verzelt zijn, ik verzeeker u, dat ze te heerlijker zullen uitblinken; laet uwe diepste donkerheden met klaere bruintens omringt zijn, op dat ze met te meerder gewelt de kracht van het licht mogen doen afsteeken. Rembrant heeft deeze deugt hoog in top gevoert, en was volleert in 't wel byeenvoegen van bevriende verwen.'*

19 *On similar ideas in Italian art theory, see M. Vasillov, 'Rhetoric and Fragments of a High Baroque Art Theory', Marsyas XX (1979/80), pp. 17-29, note 13; Missirini*

(Memorie, p. 113), has preserved the following lost statement by Pietro da Cortona: 'Gli Artisti in questo genere non pretesero che lo spettatore andasse minutamente esaminando le parti della loro tela: anzi per distorlo da ciò gli posero dinanzi gl'occhi un'insieme grandioso, armonioso, vivace, che ne lo appagasse con bella meraviglia, e sorpresa.'

20 *Hoogstraten, p. 176: 'De rechte Meesters brengen te weeg, dat haer geheele werk een- wezich is,(...). Rembrant heeft dit in zijn stuk op den Doele tot Amsterdam zeer wel, maer na veeler gevoelen al te veel, waergenomen, maekende meer werks van het groote beelt zijner verkiezing, als van de byzondere af- beeltsels, die hem waren aenbesteet. Echter zal dat zelve werk, hoe onberispelijk, na mijn ge- voelen al zijn meedestrevers verdueren, zijnde zoo schilderachtich van gedachten, zoo zwier- ich van sprong, en zoo krachtich, dat, nae zommiger gevoelen, al d'andere stukken daer als kaerteblaren nevens staen. Schoon ik wel gewilt hadde, dat hy'er meer lichts in ontstee- ken had.'*

21 *See also Chapter XI, p. 271.*

22 *Sandrart, Teutsche Academie etc., Part I, Book III, Chapter XIII, p. 85: 'Diss ist eine sehr nötige Observanz, wird aber wenig erkennet. Und hierin haben wir zu lernen von unserem verwunderbaren Bamboots, auch von andern, insonderheit von dem Laboriosen und dissfalls hoch vernünftigen Rembrandt; welch, wie in deren Leben zu ersehen, gleichsam Wunder gethan und die, wahre Harmonie, ohn Hinternis einiger besondern Farbe, nach den Regeln des Liechts, durchgehends wol beobachtet!'*

23 *See Chapter VI, note 36.*

[H2] NOTES CHAPTER XI

I am grateful to Jonathan van de Wetering, Wardy Poelstra and Marijke Koch for their assistance while writing this chapter.

1 *Hoogewerff, G.J., De twee reizen van Cosimo De' Medici Prins van Toscane door de Neder- landen (1667-1669), Journalen en Documenten, Amsterdam 1919, pp. xiii, xx, xxi. Hollantse Mercurius: behelzend het ghedenckweerdighste in Christenrijck voorgevallen, 1667/68; Lieuwe van Aitzema, Saken van Staet en Oorlogh, 's Gravenhage, 6 vols. 1669-1672, Vol VI.*

2 *Cosimo III De' Medici (Florence 1642 - Florence 1723) succeeded his father Ferdinand II, Grand Duke of Tuscany, in 1670.*

3 *op. cit. (note 1), pp. 66-67.*

4 *op. cit. (note 1), pp. 66-67.*

5 *Rembrandt doc., 1640/16, p. 202.*

6 *Schillemans, Robert, 'Gabriel Bucelinus and "The Names of the Most Distinguished European Painters"', in Mercury 6 (1987), pp. 25-37. Schillemans, Robert, '"Rimprant, nostrae aetatis miraculum" (Rembrandt, het wonder van onze tijd)' in Kroniek van het Rembrandthuis 1 (1991), pp. 17-20; Wetering, E. van de, '"The Miracle of our Age", Rembrandt through the Eyes of his Contemporaries', in: A. Blankert e.a., Rembrandt: a Genius and his Impact, Melbourne/Zwolle 1997, pp. 58-68.*

7 *Lambert van den Bos, 't Konstkabinet van Maerten Kretzer, 't Amsterdam, 1650; this passage of the poem was translated by Seymour Slive,* op. cit. *pp. 44-45.*

8 *Huygens, p. 86.*

9 *Philips Angel, Lof der Schilder-Konst, Leiden 1642, reprint, Utrecht 1969, p. 47.*

10 *Bredius, A., 'Het schildersregister van Jan Sysmus, Stads Doctor van Amsterdam, Oud Holland VIII (1890), pp. 1-17, idem pp. 217-234, idem pp. 297-313, XII (1894), pp. 161-171, XIII (1895), pp. 112-120. Bredius only reproduced and commented on the list of painters active around 1670. The notebook contains more information. Jaap van der Veen who has had access to the entire notebook kindly gave me the information referred to.*

11 a1701*Slive, p. 9.*

12 *Sandrart, J. von, Teutsche Academie, Part II, Book III, Chapter XXII, p. 326; see also Slive, p. 208.*

13 *Emmens, J.A., Rembrandt en de regels van de kunst, (Dissertation Utrecht 1964) Utrecht 1968; republished in Verzameld Werk II, Amsterdam 1979, p. 274.*

14 *Pels, A., Gebruik en Misbruik des Toneels, Amsterdam 1681, lines 35-37. See for the passage referred to Slive, p.* 210, *Appendix E.*

15 *E. van de Wetering,* op. cit. *(note 6), p. 58.*

16 *Gerard de Lairesse, Het Groot Schilderboeck, Amsterdam 1707, V, p. 325.*

17 *Van Mander, Grondt, Fol. 3 recto, 23.*

18 *E. van de Wetering, 'De Schilder', in: Gestalten van de Gouden Eeuw. Een Hollands groepspotret, Amsterdam 1996, pp. 219-239.* I owe the information on this pamphlet to Marieke de Winkel.

19 *Baldinucci, F., Cominciamento, e progresso del-l'arte dell'intagliare in rame, colle vite di molti de'più eccellenti Maestri della Professione, Florence 1686, 79. See also Slive, p. 112.*

20 Ibidem.

21 *Hoogstraten, p. 237.*

22 *J.J. Denier van der Gon, 'Spontaneity in Motor Expression and the Art of Playing the Spinal C(h)ord', in: H.L.C. Jaffé, J. Storm van Leeuwen, L.H. van der Tweel (eds.), Authen-tication in the Visual Arts: A Multidisciplinary Symposium, Amsterdam, 13 March 1977, Amsterdam 1979, pp. 93-102.*

23 *On developments in the history of philosophyand art theory dealing with this phenomenon see the Introduction by Gottfried Boehm to: Konrad Fiedler, Schriften zur Kunst (2 vol.), Munich 1971, Vol I, pp. xxvi ff.*

[H2] NOTES PREFACE TO THE PRESENT EDITION; SUMMARY OF THE BOOK AND ADDITIONAL INSIGHTS AFTER 1997

1 *E. van de Wetering e.a. A Corpus of Rembrandt 13 Paintings, Vol. IV Self-portraits, Dordrecht 2005.*

2 *Karin Groen, 'Grounds in Rembrandt's workshop and in paintings by his contemporaries', in Corpus Vol. IV, op.cit.1, p. 319-334.*

3 *E. van de Wetering, Corpus Vol. IV, Chapter III, p. 117-132.*

4 *E. van de Wetering e.a., A Corpus of Rembrandt Paintings, Vol. V, Chapter I (forthcoming).*

5 *For additional information on the production and use of 'tafeletten' or tablebooks, see Edward Norgate, Miniatura or the Art of Limning (original manuscript 1627/28-1648), 1997*, p. *109 lines 9-12; p. 135/36 note 67; p. 211 note 311; p. 238. Peter Stallybrass, 'Hamlet's Tablets and the Technologies of Writing in Renaissance England', in Shakespeare Quarterly 55:4 (winter 2004), p. 379-419.*

6 *E. van de Wetering, 'Rembrandt's beginnings; an essay', in exhib. cat.: The Mystery of the Young Rembrandt, Kassel/Amsterdam 2001/2002, p. 22-57. Arjan de Koomen was the first to suggest that seventeenth-century painted studio scenes should be seen in the context of instructive studio visits by art lovers.*

7 *E. van de Wetering, 'Rembrandt's oil studies: new light on an old problem' in* ibid. *Rembrandt. Quest of a genius, Amsterdam Museum Het Rembrandthuis, 2006, p. 179-207.*

8 *E. van de Wetering, 'Remarks on Rembrandt's oil-sketches for etchings' in: exhib. cat. Rem - brandt the Printmaker, Amsterdam/ London*, 2000, p. 36-63.

9 *For The Mill, see E. van de Wetering, 'De molen', in exhib. cat. Rembrandts landschappen, Leiden 2006-2007, p. 74-91.*

10 *E. van de Wetering, 'Canvas research with Emil Bosshard. Some remarks on method', in Emil Bosshard. Paintings Conservator (1945-2006). Essays from Friends and Colleagues, 2008, p. 239-251.*

11 *The initiative was taken by Prof. C. Richard Johnson Jr. of Cornell University in collaboration with Dr. Ella Hendriks, Head of Conservation at the Van Gogh Museum.*

12 *E. van de Wetering, 'Opmerkingen over de relatie tussen techniek, stijl en toeval bij Arent de Gelder; een vergelijking met Rembrandt' inexhib. cat. Arent de Gelder, Rembrandts laatste leerling, Dordrecht, 1998, p. 18-35.*

13 *Corpus IV, p. 168-171.*

14 *E. van de Wetering, 'Rembrandt as a searching artist' in* ibid. *Rembrandt. Quest of a genius, Amsterdam 2006, p. 79-123.*

15 Op. cit. *14, p. 115-122.*

16 Op. cit. *14, p. 99.*

17 *E. van de Wetering, Corpus IV, Chapter III, p. 307-311.*

18 *Karin Groen, 'An investigation of the use of binding medium by Rembrandt: Chemical analyses and rheology', Zeitschrift für Kunst - technologie und Konservierung 11 (1997), Heft 2.*

19 *L. Carlyle, M. Witlox, 'Historically accurate reconstructions of artists' oil painting materials', Art of the Past: Sources and Reconstructions, proceedings of the first symposium of the Art Technological Research study group, London 2005.*

20 *E. van de Wetering, 'The cleaning of paintings by Rembrandt: New arguments in a controversy, Louvre Paris, 1 December 2006', in: ICOM Conservation Committee Newsletter No. 13 (Feb. 2007) p. 9-11; E. van de Wetering, 'The aged painting and the necessities and possibilities to know its original appearance' in: H. Cantz (ed.) Horizons. Essays on art and art research. 50 Years Swiss Institute for Art Research, Zürich, 2001, p. 399-406.*

21 *Michael Podro in conversation with Sir Ernst Gombrich in: Apollo (December 1989), p. 37378, esp. p. 374.*

22 *E. van de Wetering, 'Rembrandt's art; attempting an objective evaluation', in* ibid. *Rembrandt. Quest of a genius, Amsterdam Museum Het Rembrandthuis, 2006, p. 235248. Also published in German: 'Rembrandts Kunst. Versuch einer objektiven Würdigung', in exhib.cat. Rembrandt. Genie auf der Suche, Berlin, Gemäldegalerie Staatliche Museen zu Berlin, 2006, p. 225-237.*

23 *E. van de Wetering, 'Connoisseurship and Rembrandt's paintings: new directions in the Rembrandt Research Project, part II', in: The Burlington Magazine (CL) February 2008.*

[h1] Bibliography

a1739

LIST OF SHORT TITLES

[H2] ART IN THE MAKING

- Bomford, David, Christopher Brown, Ashok Roy, Art in the Making. Rembrandt, London 1988

[H2] B

- Adam Bartsch, Catalogue raisonné de toutes les estampes qui forment l'oeuvre de Rembrandt, et ceux de ses principaux imitateurs, composé par Gersaint, Helle, Glomy et P. Hyver (2 vols.), Vienna 1797

[H2] BALDINUCCI

- Baldinucci, Filippo, Cominciamento e progresso dell'arte dell'intagliare in rame, colle vite di molti de'più eccellenti Maestri della stessa Professione, Florence 1686

[H2] BEN

- Otto Benesch, The Drawings of Rembrandt.
- A Critical and Chronological Catalogue (6 vols.), London 1954-57. Enlarged and edited by Eva Benesch, London 1973

[H2] BR

- A. Bredius, Rembrandt schilderijen, Utrecht 1935 (German edn. Vienna 1935, English edn. London 1937); A. Bredius, Rembrandt. The Complete Edition of the Paintings, revised by H. Gerson, London 1969

[H2] LE BRUN

- Brun, Pierre Le, 'Recueuil des Essaies des Merveilles de la Peinture', 1635, manuscript published in Original Treatises On the Arts of Painting, ed. Mary P. Merrifield, Vol. II, New York 1967 (ed. princ. London 1849)

[H2] CORPUS

- J. Bruyn, B. Haak, S.H. Levie, P.J.J. van Thiel and E. van de Wetering, A Corpus of Rembrandt Paintings (3 vols.), The Hague/Boston/ London vol. I (1982), vol. II (1986), vol. III (1989). E. van de Wetering, M. Franken, P.G.T. Broekhoff, e.a. A Corpus of Rembrandt Paintings, vol. IV, Dordrecht/Boston/London (to be published in 1998)

[H2] EMMENS

- J. Emmens, Rembrandt en de regels van de kunst, Utrecht 1968

[H2] EXHIB. CAT. 1991/92

- Exhibition Catalogue 1991/92: Rembrandt: The Master and his Workshop, Paintings, New Haven/London 1991

[H2] HOOGSTRATEN

- Samuel van Hoogstraten, Inleyding tot de hooge schoole der schilderkonst: anders de zichtbaere werelt, Rotterdam 1678

[H2] HOUBRAKEN

- Arnold Houbraken, Groote Schouburgh der Nederlantsche Konstschilders en Schilderessen (3 vols.), Amsterdam 1718-21. Used 2nd edition 1753

[H2] HUYGENS

- Constantijn Huygens, autobiographical fragment (in Latin) (1629-1631), Koninklijke Bibliotheek, The Hague, translated by
- C.L. Heesakkers as Mijn Jeugd, Amsterdam 1987

[H2] A1768LAIRESSE

- Gerard de Lairesse, Het Groot Schilderboeck
- (2 vols.), Amsterdam 1707. Used edition 1740

[H2] VAN MANDER, GRONDT

- Karel van Mander, Den grondt der edel vry schilder-const, Haarlem 1604, republished with a translation and commentary by Hessel Miedema (2 vols.), Utrecht 1973

[H2] VAN MANDER, LEVENS

- Karel van Mander, Het Schilder-Boeck, Haarlem 1604. Karel van Mander, The Lives of the Illustrious Netherlandish and German Painters, from the first edition of the 'Schilder-boeck (1603-1604), with an introduction and translation, edited by Hessel Miedema (vol. I-), Doorn- spijk 1994

[H2] NAT. HIST

- G. Plinius Secundus, Naturalis Historia, ed.
- Loeb, Classical Library (10 vols.), Cambridge (Mass.)/London 1958-62. Edition H.
- Rackham, London/Cambridge (Mass.) 1968

[H2] REMBRANDT DOC

- W.L. Strauss and M. van der Meulen (with assistance of S.A.C. Dudok van Heel and P.J.M. de Baar), The Rembrandt Documents, New York 1979

[H2] SLIVE

- Seymour Slive, Rembrandt and his Critics, 1630-1730, The Hague 1953.

[H2] VASARI

- Giorgio Vasari, Le vite de' piu eccellenti pittori, scultori, e architettori, 1568, edition Paola Barocchi, Florence 1987. Used edn. Lives of the Painters, Sculptors and Architects, translated by Gaston du C. de Vere with an introduction and notes by David Ekserdjian (2 vols.), New York 1996.

[H2] BIBLIOGRAPHY

- Abraham, Liesbeth 'Gekleurde ondergronden op doek', *KM* voorjaar 1995, pp. 22-24 (for discussion following this article, see Chapter II, note 24).
- Addison, Joseph, 'A Dream of Painters', *The Spectator* (5 June 1711)
- Ainsworth, M.W., J. Brealey, E. Haverkamp- Begemann, P. Meyers, 'Paintings by Van Dyck, Vermeer, and Rembrandt reconsidered through autoradiography', in: *Art and Autoradiography*, New York (The Metropolitan Museum of Art) 1982, pp. 9-99
- Akker, Paul van den, 'Bij voorbeeld tekenen', *Kunstschrift* 5 (1996) pp. 15-23
- Aldrich, Phillip Fehl, Riana Fehl (eds.), *The Literature of Classical Art, De Pictura Veterum, (according to the English translation 1638), Berkeley/Los*

Angeles/Oxford 1991
- Alpers, Svetlana, *Rembrandt's Enterprise, the Studio and the Market*, Chicago/London 1988
- Amornpichetkul, Chittima, 'Seventeenth Century Italian Drawing Books: Their Origin and Development', in: *Children of Mercury; The Education of Artists in the Sixteenth and Seventeenth Centuries*, Providence/Rhode Island 1984, pp. 108-118.
- *Amsterdamsche Courant*, 8 September 1739 (Gemeente Archief, Amsterdam, 1032)
- Angel, Philips, *Lof der Schilder-Konst*, Leiden 1642, reprint, Utrecht 1969
- (Anon.), *De volmaakte Verwer, Amsterdam 1770 (Anon.), Das aufs neue wohl zubereitete Tinten-Fasz etc.*, Helmstädt 1732
- (Anon.), *Methods of Tests for Textiles*, British Standards Handbook no. II, 1963
- Archieven van de gilden, Leiden Municipal Archives 1921
- Aristotle, *The Nicomachean Ethics with an English translation by H. Rackham, The Loeb Classical Library*, London/Cambridge Mass 1956
- Baldinucci, F., *Cominciamento e progresso dell'arte dell'intagliare in rame, colle vite di molti de'più eccellenti Maestri della stessa Professione*, Florence 1686
- Baldinucci, F., *Notizie de' professori del disegno ... vols.*), Firenze 1681-1728
- Balis, Arnout, '"Fatto da un mio dicsiepolo", Rubens Studio Practices reviewed', *In: exhibcat. Rubens and his workshop: The flight of Lot and his Family from Sodom*, Tokio 1994, pp. 97-127
- Bartsch, A., Catalogue raisonné de toutes les estampes qui forment l'oeuvre de Rembrandt, et ceux de ses principaux imitateurs, composé par Gersaint, Helle, Glomy et P. *Hyver* (2 vols.), Vienna 1797
- Bastin, J., *De Gentse lijnwaadmarkt en linnenhandel in de XVIIe eeuw*, Ghent 1968
- Bauch, J., D. Eckstein, 'Dendrochronological Dating of Oakpanels of Dutch SeventeenthCentury Paintings', *Studies in Conservation* 15 (1970), pp. 45-50
- Bauch, J., D. Eckstein, 'Woodbiological Investigations on Panels of Rembrandt Paintings', *Wood Science and Technology* 15 (1981), pp. 251-263
- Bauch, J., D. Eckstein, G. Brauner, 'Dendro- chronologische Untersuchungen an Eichenholztafeln von Rubens-Gemälden', *Jahrbuch der Berliner Museen* 20 (1978), pp. 207-221
- Bauch, J., D. Eckstein, M. Meier-Siem, 'Dating the Wood of Panels by a Dendrochrono- logical Analysis of the Tree-Rings', *Nederlands Kunsthistorisch Jaarboek* 23 (1972), pp. 485-496
- Bauch, K., *Die Kunst des jungen Rembrandt*, Heidelberg 1933
- Bauch, K., *Der frühe Rembrandt und seine Zeit, Studien zur geschichtlichen Bedeutung seines Frühstils*, Berlin 1960
- Bauch, K., *Rembrandt Gemälde*, Berlin 1966
- Bedaux, J.B. 'Discipline for innocence. Metaphors for education in seventeenth-century Dutch painting' in: The Reality of Symbols, 's-Graven- hage/Maarssen 1990, pp. 109-169
- Bel, J.G. van, *De linnenhandel van Amsterdam in de XVIIIe eeuw*, Amsterdam 1950
- Benesch, O., *Rembrandt, Selected Drawings*, London/New York 1947

- Benesch, O., *The Drawings of Rembrandt. A Critical and Chronological Catalogue* (vols. I-VI), London 1954/57; enlarged and edited by Eva Benesch, London 1973
- Berger, E., *Quellen für Maltechnik während der Renaissance und deren Folgezeit*, Munich 1901, reprint 1973
- Bernsmeier, Uta, *Die Nova Reperta des Jan van der Straet. Ein Beitrag zur Problemgeschichte der Entdeckungen und Erfindungen im 16. Jahrhundert*, (dissertation) Hamburg 1986
- Beurs, Wilhelmus, *De Groote Waereld in 't kleen geschildert*, Amsterdam 1698a1818
- Blaas, P.B.M. *Anachromisme en historisch besef. Momenten uit de historie van het Europees bewust- zijn*, Rotterdam 1988
- Blankert, A., 'Rembrandt Zeuxis and Ideal Beauty', in: *Album Amicorum, J.G. van Gelder*, The Hague 1973, pp. 32-39
- Blankert, A., *Ferdinand Bol (1616-1680)*. Rembrandt's Pupil, Doornspijk 1982
- Bleeke-Byrne, Gabrielle, 'The Education of the Painter in the WorkShop', in: *Children of Mercury; The Education of Artists in the Sixteenth and Seventeenth Centuries*, Providence/Rhode Island 1984, pp. 28-39
- Bode, W., R. Dohme, 'Die Ausstellung von Gemälden älterer Meister im Berliner Privatbesitz', *Jahrbuch der Königlichen Preussischen Kunstsammlungen* IV (1883), pp. 119-151
- Bolten, Jaap, *Method and Practice; Dutch and Flemish Drawing Books, 1600-1750*, Landau Pfalz 1985 (1st ed. dissertation, Leiden 1979)
- Bomford, David, Christopher Brown, Ashok Roy, *Art in the Making. Rembrandt*, London 1988
- Boon, K.G., *Rembrandt. The Complete Etchings*, London 1963
- Boon, K.G., Nederlandish Drawings of the Fifteenth and Sixteenth Centuries, *The Hague* 1978
- Boot, J.A., 'Het linnenbedrijf in Twente omstreeks 1700', *Textielhistorische Bijdragen* 7 (1966), pp. 21-64
- Bos, Lambert van den, *Konstkabinet van Maerten Kretzer, t' Amsterdam*, 1650
- Boschini, Marco, 'Le minere della pittura', *Compandiosa informazione di Marco Boschini, non solo delle pitture pubbliche di Venezia, ma delle isole ancora circonvicine*, Venice 1664
- Bosshard, E.D., 'Tüchleinmalerei – eine billige Ersatztechnik?', *Zeitschrift für Kunstgeschichte* 45 (1982), pp. 31-42
- Brachert, T., 'Historische Keilrahmensysteme', *Maltechnik/Restauro* 79 (1973), pp. 34-38
- Brachert, T., *Patina, Von Nutzen und Nachteil der Restaurierung*, München 1985
- Bredius, A., *Künstler-Inventare*, (5 vols.), The Hague 1915-18
- Bredius, A., *Rembrandt schilderijen*, Utrecht 1935 (German edn. Vienna 1935, English edn. London 1937)
- Bredius, A., *Rembrandt. The Complete Edition of the Paintings*, revised by H. Gerson, London 1969
- Brinkman, P.W.F., *Het geheim van Van Eyck: aantekeningen bij de uitvinding van het olieverven*, Zwolle 1993
- Broos, B.P.J., 'The 'O' of Rembrandt', *Simiolus* 4 (1970), pp. 150-184

- Broos, B.P.J., 'Book review: Walter L. Strauss ..., The Rembrandt documents ...', *Simiolus* 12 (1981-82), pp. 245-262
- Brown, Christopher, 'Introduction', in: exhib. cat. *Dutch Landscape. The Early Years. Haarlem and Amsterdam 1590-1650*, (National Gallery) London 1986, pp. 11-34
- Brugghen, Gerard ter, *Verlichtery Kunst-Boeck*, Amsterdam 1616
- Brun, Pierre Le, 'Recueuil des Essaies des Merveilles de la Peinture', 1635, manuscript published in: *Original Treatises On the Arts of Painting*, ed. Mary P. Merrifield, Vol. II, New York 1967(ed. princ. London 1849)
- Bruyn, J., 'Een onderzoek naar 17de-eeuwse schilderijformaten, voornamelijk in Noord- Nederland', *O.H*. 93 (1979), pp. 96-115
- Bruyn, J., B. Haak, S.H. Levie, P.J.J. van Thiel, E. van de Wetering, *A Corpus of Rembrandt Paintings* (Vols. I, II, III) The Hague/Boston/ London, 1982, 1986, 1989
- Bruyn, J., 'On Rembrandt's Use of Studio-Props and Model Drawings during the 1670s' in *Essays in Northern European Art, Presented to Egbert Haverkamp-Begemann on his Sixtieth Birthday*, Doornspijk 1983
- Burroughs, A., 'New Illustrations of Rembrandt's Style', *Burlington Magazine* 59 (1931), pp. 3-10
- Castiglione, Baldassare, *Il Libro del Cortegiano*, Venice 1528, p. 18, transl. into Dutch by Lambert van de Bos, as: De volmaeckte Hovelinck, van de graaf Baldassare de Castiglione, Amsterdam 1662
- Cennini, C. d'A., *Il Libro dell'Arte, transl. D. V. Thompson as The Craftsman's Handbook*, New Haven 1933, Dover ed. (n.d).
- Cennini, C. d'A., *Il Libro dell'Arte*, ed. Franco Brunello, Vicenza 1982
- Chantelou, Paul Fréart de, *Diary of the Cavaliere Bernini's Visit to France*, edited and with an introduction by Anthony Blunt, Princeton 1985
- Chapman, H. Perry, *Rembrandt's Self-Portraits*. A Study in Seventeenth-Century Identity, Princeton 1990
- Christensen, Carol, e.a., 'Van Dyck's Painting Technique, his Writings, and Three Paintings in the National Gallery of Art', in exhib. cat. *Anthony van Dyck*, Washington (National Gallery of Art) 1990/91, pp. 45-52
- Clark, K., *Rembrandt and the Italian Renaissance*, London 1966
- Cole, B., *The Renaissance Artist at Work*, London 1983
- Coremans, P., J. Thissen, 'Het wetenschappelijk onderzoek van het zelfportret van Stuttgart', *Bulletin de l'Institut Royal du Patrimoine Artistique* 7 (1964), pp. 187-195
- Coypel, A., *Discours, prononcez dans les conférences de l'Academie Royale de Peinture et de Sculpture*, Paris 1721
- Defoer, H.L.M., 'Rembrandt van Rijn, De Doop van de Kamerling', *O.H*. 91 (1977), pp. 2-26
- Denier van der Gon, J.J., 'Spontaneity in Motor Expression and the Art of Playing the Spinal C(h)ord', in: H.L.C. Jaffé, J. Storm van Leeuwen, L.H. van der Tweel (eds.), *Authentication in the Visual Arts: A Multidisciplinary Symposium*, Amsterdam, 13 March 1977, Amsterdam 1979, pp. 93-102
- Denucé, J., *Kunstuitvoer in de 17de eeuw te Antwerpen. De firma Forchoudt*, Antwerpen 1931

- Dijk, Jan van, Kunst- en historiekundige beschrijving van alle schilderijen op het Stadhuis van Amsterdam, met beoordelingen en aanmerkingen over de stukken en korte levensbeschrijvingen van derzelver schilders, Amsterdam 1758 2nd ed.; 1st ed. published in 1756
- Dillen, J.G. van, Bronnen tot de geschiedenis van het bedrijfsleven en het gildewezen van Amsterdam (3 vols.), *The Hague* 1929, 1933, 1974
- Doerner, M., *Malmaterial und seine Verwendung im Bilde, Stuttgart 1960 (1st ed. Stuttgart 1921). English translation by Eugen Neuhaus, 1934. The materials of the artist and their use in painting: with notes on the techniques of the old masters*. Revised ed. London: Hart-Davis, 1969.
- Dudok van Heel, S.A.C., 'Het "schilderhuys" van Govert Flinck en de kunsthandel van Uylen- burgh aan de Lauriergracht te Amsterdam', *Jaarboek ... Amstelodamum* 74 (1982), pp. 70-90
- Eastlake, C.L., *Methods and Materials of Painting of the Great Schools and Masters*, (2 vols., 1847), New York 1960
- Eikelenberg, Simon, Aantekeningen over de schilderkunst, 1679-1704, Ms., Municipal Archives Alkmaara1866
- Eikema Hommes, Margriet H. van, 'A Proposal for the Classification of Painting Recipes', *Preprints of the 11th Triennial Meeting of the icom Committee for Conservation*, Edinburgh 1-6 sept. 1996, London 1996, vol. I, pp. 381-387
- Eikema Hommes, Margriet H. van, 'The Painters' Anticipation on Colour Changes as Discussed in Seventeenth – early Eighteenth-Century Sources on Painting Technique', *Leids Kunsthistorisch Jaarboek* 1997 (forthcoming)
- Eirich, F.R. (ed.), *Rheology*, (5 vols.), New York 1956-69
- Emmens, J.A., 'Natuur, onderwijzing en oefening', in: *Album Discipulorum J.G*. van Gelder, Utrecht 1963, pp. 125-136
- Emmens, J.A., *Rembrandt en de regels van de kunst, (dissertation Utrecht 1964)* Utrecht 1968; republished in Verzameld Werk II, Amsterdam 1979
- Exhibition Catalogue *1991/92: Rembrandt: The Master and His Workshop, Paintings*, New Haven/London 1991
- Feller, Robert L., *On Picture Varnishes and their Solvents*, Obelin 1959; revised ed. 1971
- Fiedler, Konrad, *Schriften zur Kunst* (ed. Gottfried Boehm), Munich 1971
- Floerke, H., *Studien zur niederländischen Kunst- und Kulturgeschichte. Die Formen des Kunsthandels, das Atelier und die Sammler in den Niederlanden vom 15.-18*. Jahrhundert, Munich/ Leipzig 1905
- Fréart de Chantelou, Paul, *Diary of the Cavaliere Bernini's Visit to France*, edited and with an introduction by Anthony Blunt, Princeton 1985
- Freise, K., *Pieter Lastman, sein Leben und seine Kunst*, Leipzig 1911
- Frimmel, Th. v., *Handbuch der Gemäldekunde*, Leipzig 1904
- Froentjes, W., 'Schilderde Rembrandt op goud', *O.H*. 84 (1969), pp. 233-237
- Fromentin, E., *Les maîtres d'autrefois. Belgique – Hollande*, Paris 1876
- Füessli, J.H., *Vorlesungen über die Malerei*, Braunschweig 1803, transl. Joachim Eschenburg
- Gaehtgens, B., *Adriaen van der Werff 1659-1722*, Munich 1987
- Gans, L., 'De mythe van Karel Appel's "Anrot- zooien"', in: *Album Discipulorum J.G*. van Gelder, Utrecht 1963, pp. 179 ff

- Gantner, Joseph, *Rembrandt und die Verwandlung klassischer Formen*, Bern/Munich 1964
- Geete, R., *Peder Månssons skrifter på Svenska*, Stockholm 1913/15
- G(elder), H.E. van, 'Een schilder aan de arbeid', *Mededelingen van de dienst voor kunsten en wetenschappen der Gemeente 's Gravenhage*, 4 (1937), pp. 70-73
- Gelder, J.G. van, 'De Schilders van de Oranjezaal', *Nederlands Kunsthistorisch Jaarboek* 1 (1948/49), pp. 119-164
- Gerson, H., *Rembrandt Paintings*, Amsterdam 1968
- Gerson, H., 'Rembrandt's workshop and assistants', in: *Rembrandt after Three Hundred Years: A Symposium*, Chicago 1973, pp. 19-31
- Gerson, H.; see: *Bredius, A*. (1969)
- Gettens, R.J., G.L. Stout, *Painting Materials. A Short Encyclopedia*, New York 1942
- Giltay, Jeroen, 'Een onbekende schets van Rembrandt', *De Kroniek van het Rembrandt- huis*, 29/1 (1977), pp. 1-9
- Glück, G., *Niederländische Gemälde aus der Sammlung des Herrn Alexander Tritsch in Wien...*, 1907
- Goedings, T., 'Een zeventiende-eeuwse verklaring voor het woord schulpwit', *IIC Nederland Mededelingenblad* 6, 1989, pp. 7-12
- Goeree, W., *Inleidinge tot de Algemeene Teyken- Konst*, Middelburg 1668; 3rd ed. 1697
- Goeree, W., *Inleydingh tot de practijck der Al-gemeene Schilder-Konst*, Middelburg 1670
- (Gogh, V. van), *Verzamelde brieven van Vincent van Gogh*, ed. J. van Gogh-Bonger, Amsterdam/ Antwerp 1953
- Golahny, Amy, *Rembrandt and the Venetian Tradition, PhD thesis*, Columbia University 1984
- Gombrich, E.H., 'Michael Podro in Conversation with Sir Ernst Gombrich', *Apollo* (December 1989), pp. 373-378
- Gombrich, E.H., *Art and Illusion, A Study in the Psychology of Pictorial Representation*, Oxford 1960; 5th ed., 6th impression (1988)
- Gombrich, E.H., 'Rembrandt Now', *The New York Review of Books*, (March 1970), pp. 6-15
- Gombrich, E.H., 'Light, Form and Texture in Fifteenth-Century Painting North and South of the Alps' in: Ernst H. Gombrich, *The Heritage of Apelles*, pp. 19-35
- Graaf, J.A. van de, *Het Mayerne Manuscript als bron voor de schildertechniek van de Barok*, Utrecht 1958
- Granlund, John, *'Peder Månssons skrifter', Kulturhistoriskt lexikon för nordisk medeltid 13*, Malmö 1968, col. 156
- Grimm, Claus, *Rembrandt selbst. Einen Neubewertung seiner Porträtkunst*, Stuttgart/Zürich 1991
- Groen, K., 'Schildertechnische aspecten van Rembrandts vroegste schilderijen, micro- scopische observaties en de analyse van verf- monsters', *O.H*. 91 (1977), pp. 66-74
- Groen, K., Ella Hendriks, 'Frans Hals: een technisch onderzoek', in: exhib. cat. *Frans Hals* (Frans Hals Museum, Haarlem), Den Haag 1989, pp. 109-127

- Groen, K., 'An investigation of the use of binding medium by Rembrandt: Chemical Analyses and Rheology', *Zeitschrift für Kunsttechnology und Konservierung* 11 (1997), Heft II (forthcoming)
- Guicciardini, L., *Beschrijvinghe van alle de Neder- landen*, Amsterdam 1612 (first Italian ed. 1567)
- Haak, B., *Rembrandt. Zijn leven, zijn werk, zijn tijd*, Amsterdam 1969
- Haak, B., 'Nieuw licht op Judas en de zilverlingen van Rembrandt', in: *Album Amicorum J. G. van Gelder, The Hague* 1973, pp. 155-158
- Haitsma Mulier, Eco, 'De achttiende eeuw als een eeuw van het historisch besef', *De Achttiende Eeuw* 26 (1994) 2, 147-152
- Haskell, Francis, *Patrons and Painters, Art and Society in Baroque Italy*, revised and enlarged ed., New Haven/London 1980
- Haverkamp-Begemann, Egbert, *Rembrandt. The Nightwatch*, Princeton 1982
- Haverkorn van Rijsewijk, P., 'Rotterdamse schilders; De Schilders Volmarijn', *O.H*. 12 (1894), pp. 136-159
- Hecht, P., exhib. cat. *De Hollandse fijnschilders; van Gerard Dou tot Adriaen van der Werff*, (Rijksmuseum), Amsterdam 1989
- Hedly, Gerry, e.a., 'Long Lost Relations and New Found Relativities: Issues in the Cleaning of Paintings', in: C. Villers (ed.), *Measured Opinions, Collected Papers on the Conservation of Paintings*, London 1993
- Heiland, S., H. Lüdecke, *Rembrandt und die Nachwelt*, Leipzig [1960]
- Held, J.S., *Rubens, Selected Drawings*, (2 vols.), London 1959
- Hell, J., 'Beobachtungen über Rembrandts Malweise und Probleme der Konservierung', *Kunstchronik* 10 (1957), pp. 138-141a1921
- Hendy, Philip, *Isabella Stewart Gardner Museum. Catalogue of the Exhibited Paintings and Drawings*, Boston 1931
- Hendy, P.H., A.S. Lucas, 'The Ground in Pictures', *Museum* 21 (1968), pp. 266-276
- Henny, Xenia, 'Hoe kwamen de Rotterdamse schilders aan hun verf?' *In: exhib. cat. Rotterdamse Meesters uit de Gouden Eeuw*, (Historisch Museum Rotterdam) 1994/95, Zwolle 1994, pp. 43-53
- Héoard, Jean, *Journal de Jean Héoard sur l'enfance et la jeunesse de Louis XIII*, (2 vols.), Paris 1868
- Hermesdorf, P.F.J.M., J. Giltay, E. van de Wetering, 'Enkele gegevens over Rembrandts "De eendracht van het land"', *O.H*. 100 (1986), pp. 35-49
- Hirst, Michael, Jill Dunkerton, *Making and Meaning. The Young Michelangelo*, London 1995
- Hofstede de Groot, C., Die Urkunden über Rembrandt, Haag 1906 (Quellenstudien zur holländischen Kunstgeschichte, herausgegeben unter der Leitung von Dr. C. Hofstede de Groot, III)
- Hofstede de Groot, C., Beschreibendes und kritisches Verzeichnis der Werke der hervorragendsten holländischen Maler des XVII. *Jahrhunders*, vol. VI, Esslingen a. N./Paris 1915
- Hoogewerff, G.J., De twee reizen van Cosimo De' Medici Prins van Toscane door de Nederlanden (1667-1669), *Journalen en Documenten*, Amsterdam 1919
- Hoogstraten, Samuel van, *Inleyding tot de hooge schoole der schilderkonst: anders de zichtbaere werelt*, Rotterdam 1678

- Horatius, Ars Poetica. *The English translation is from Horace, Satires, Epistles and Ars Poetica*, trans. H. Rushton Fairclough, London/Cambridge (Mass.) 1947
- Horner, J., *The linen trade in Europe during the spinning wheel period*, Belfast 1920
- Houbraken, Arnold, *Groote Schouburgh der Neder- lantsche Konstschilders en Schilderessen* (3 vols.), Amsterdam 1718-1721; used second edn. 1753
- Houtzager, M.E., M. Meier-Siem, H. Stark, H.J. de Smedt, *Röntgenonderzoek van de oude schilderijen in het Centraal Museum te Utrecht*, Utrecht 1967
- Huygens, Constantijn, autobiographical fragment (in Latin) (1629-1631), *Koninklijke Biblio- theek, The Hague, translated by C.L. Hees- akkers as: Mijn Jeugd*, Amsterdam 1987
- Israëls, Jozef, 'Rembrandt', *De Gids* 3 (1906), pp. 1-13
- Jaffé, M., *Rubens Cataloge Completo*, Milano 1989
- Jager, R. de, 'Meester, leerjongen, leertijd. Een analyse van 17de-eeuwse leerlingcontracten van kunstschilders, goud- en zilversmeden', *O.H*. 104 (1990), pp. 69-111
- Johnson, B.B., 'Examination and treatment of Rembrandt's "Raising of Lazarus" ', *Los Angeles County Museum of Art Bulletin* 20/2 (1974), pp. 18-35
- Jongh, E. de (ed.), *Tot lering en vermaak: beteke- nissen van Hollandse genrevoorstellingen uit de zeventiende eeuw*, Amsterdam 1967
- Jongh, E. de, review of B. Haak, Hollandse schilders in de Gouden Eeuw, *Simiolus* 15 (1985), p. 67
- Jost, I., 'Bemerkungen zur Heinrichsgalerie des P.P. Rubens', *Nederlands Kunsthistorisch Jaar- boek* 15 (1964), pp. 175-219
- Junius, Fr., De pictura veterum, Amsterdam 1637; Dutch translation, De Schilderkonst der Oude Begrepen in Drie Boeken, Middelburg 1641; English translation, The Painting of the Ancients, London 1638; *The Literature of Classical Art, De Pictura Veterum*, (according to the English translation 1638), Berkeley/Los Angeles/Oxford 1991
- Keller, Renate, 'Leinöl als Malmittel', *Maltechnik* 2, 1973, pp. 74-105.
- Kemp, Wolfgang, *Zeichnen und Zeichenunterricht der Laien 1500-1870: Ein Handbuch*, Frankfurt am Main 1979
- Kerssemakers, A., in: *De Amsterdammer, Weekblad voor Nederland*, 14 (April 1912), p. 6
- Kettering, Alison McNeill, *Drawings from the Ter Borch family Studio Estate*, (2 vols.), Amsterdam 1988
- Kirby, Jo and Raymond White, 'The Identification of Red Lake Pigment Dyestuffs and a Discussion of their Use', *National Gallery Technical Bulletin*, Vol. 17 (1996), pp. 56-80
- Klein, P., D. Eckstein, T. Wazny, J. Bauch, 'New findings for the dendrochronological dating of panel paintings of the 15th to the 17th century', *ICOM Committee for Consevation*. 8th Triennial Meeting Sydney, Australia, 6-11 September, 1987. Preprints, Los Angeles 1987
- Klein, P., 'Hat Rembrandt auf Zuckerkistenholz gemalt?', *Zuckerhistorischen Beiträge aus der Alten und Neuen Welt, Schriften aus dem ZuckerMuseum, Heft* 25, Berlin 1988
- Klotz, G., 'Hogarth und Addison', *Zeitschrift für Kunstgeschichte* XXII (1959), pp. 102 ff

- Knuttel, G.,'Rembrandt's earliest works', *Burlington Magazine* 97 (1955), pp. 44-49
- Kockaert, L., 'Note sur les émulsions des Primitifs Flamands', *Bulletin IRPA-KIK* XIV (1973/74), pp. 133-139
- Kockaert, L., M. Verrier, 'Application des colorants à l'identification des liants de Van Eyck', *Bulletin IRPA-KIK* XVII (1978/79), pp. 122-127
- Kolloff, E., 'Rembrandt's Leben und Werke nach neuen Actenstücken und Gesichtspunkten geschildert', *Historisches Taschenbuch* 5/3 (Leipzig 1854), reprinted by Deutsches Bibel-Archiv, Hamburg 1971 with introduction and index by Christian Tümpel, pp. 401-582
- Kris, Ernst, Otto Kurz, *Die Legende vom Künstler, Vienna 1934. English translation with an introduction by E.H. Gombrich, Legend, Myth, and Magic in the Image of the Artist*, New Haven/London 1979
- Kühn, H., 'Untersuchungen zu den Malgründen Rembrandts', *Jahrbuch der Staatlichen Kunstsammlungen in Baden-Württemberg* 2 (1965), pp. 189-210
- Kühn, H., 'Untersuchungen zu den Pigmenten und Malgründen Rembrandts, durchgeführt an den Gemälden der Staatlichen Kunstsammlungen Kassel', *Maltechnik/Restauro* 82 (1976), pp. 25-33
- Kühn, H., 'Untersuchungen zu den Pigmenten und Malgründen Rembrandts, durchgeführt an den Gemälden der Staatlichen Kunstsammlungen Dresden', *Maltechnik/Restauro* 83 (1977), pp. 223-233
- Kuiper, L., 'Restauratie-verslag van Hendrick ter Brugghen's Aanbidding der Koningen', *Bulletin van het Rijksmuseum* 19 (1971), pp. 117-135
- Kultermann, U., *Geschichte der Kunstgeschichte*, Vienna/Düsseldorf 1966
- Lairesse, G. de, *Het Groot Schilderboeck* (2 vols.), Amsterdam 1707. Used edn. 1740
- Lalanne, M. Ludovic, *Gazette des Beaux Arts* 15 (1877) – 32 (1885), esp. 26, 2e période (1882), p. 534a1965
- Laurie, A.P., *The Painter's Methods and Materials*, New York 1967
- Lehman, Phyllis Williams *Cyriacus of Ancona's Egyptian Visit and its reflections in Gentile Bellini and Hieronymus Bosch*, New York 1977
- Linton, G.H., The Modern Textile Dictionary, New York 1962 (1st ed. 1954)
- Lootsma, S., *Historische studiën over de Zaanstreek, Koog aan de Zaan* 1950
- Lucas, A., *Ancient Egyptian Materials and Industries*, London 1926, 4th ed. London 1962, revised and enlarged by R. Harris Mander, K. van, Den grondt der edel vry schilder- const, Haarlem 1604, republished with a translation and commentary by H. Miedema (2 vols.), Utrecht 1973
- Mander, K. van, Het Schilder-Boeck, Haarlem 1604; Karel van Mander, The Lives of the Illustrious Netherlandish and German Painters, from the first edition of the 'Schilder-boeck' (1603-1604), *With an introduction and translation*, edited by Hessel Miedema, (vol.I-), Doornspijk 1994
- Manzart, G.P., Le Peintre amateur et curieux, *Bruxelles* 1763
- Marette, J., *Connaissance des Primitifs par l'étude du bois*, Paris 1961
- Marijnissen, R.H., *Dégradation, conservation et restauration de l'oeuvre d'art*, Bruxelles 1967
- Marijnissen, R.H., 'Het Stuttgarts vermeend zelf- portret van Rembrandt', Archivalia van een wetenschappelijk onderzoek, Mededelingen van de

Koninklijke Academie voor Wetenschappen, *Letteren en Schone Kunsten van België* 52/1 (1992), pp. 3-18
- Maroger, J., *The Secret Formulas and Techniques of the Masters*, New York 1979 (1st ed. 1948)
- Martin, W., 'Een "Kunsthandel" in een klapper- manswachthuis', *O.H*. 19 (1901), pp. 86-88
- Martin, W., 'Bladvulling', *O.H*. 20 (1902), p. 64
- Martin, W., 'The life of a Dutch artist in the Seventeenth Century', *Burlington Magazine* 7 (1905), pp. 125-128; (1905/06), pp. 13-24
- Martin, W., 'How a Dutch Picture was Painted', *Burlington Magazine* 10 (1906/07), pp. 144-154
- Martin, W., 'De Jan Steen-tentoonstelling te Londen', *Onze Kunst* 16 (1909), p. 140
- Martin, W., 'Rembrandt-Rätsel', *Der Kunstwanderer*, 1921, pp. 6-8 and 30-34
- Martin, W., *De Hollandsche schilderkunst in de zeventiende eeuw* (2 vols.), Amsterdam 1935
- Martin, W., *Gerard Dou*, Stuttgart/Berlin 1913 (Kl. d. K.)
- Masschelein-Kleiner, Ancient Binding Media, Varnishes and Adhesives, (English translation) Rome 1985; 1st ed. *Liants, vernis et adhésifs anciens*, Belgium 1978
- McKim-Smith, Gridley, 'Writing and Painting in the Age of Velazquez', in: *Gridley McKim-Smith et al., Examining Velazquez*, New Haven/London 1988
- Meder, Joseph, *Die Handzeichnung ihre Technik und Entwicklung*, Wenen 1923
- Meder, Joseph, *The Mastery of Drawing*, vol. I, translated and revised by Winslow Ames, New York 1978
- Meijer Jr., D.C., 'De Amsterdamsche Schutters- stukken in en buiten het nieuwe RijksMuseum', *O.H*. 7 (1889), pp. 45-60
- Meissner, G., *Max Liebermann*, Wien/München 1974
- Mens, Jan, *Meester Rembrandt*, 4th ed., Amsterdam/Antwerpen 1950
- Merrifield, M.P. (ed.), *Original Treatises on the Arts of Painting*, New York 1967, 1st ed. London 1849
- *Methods of Tests for Textiles*, British Standards Handbook no. II, 1963
- Miedema, H., 'Johannes Vermeers Schilderkunst', *Proef* (september 1972), p. 75
- Miedema, H., *De archiefbescheiden van het St. Lukasgilde te Haarlem*, Alphen a.d. Rijn 1980
- Miedema, H., Further Research into 17th Century Picture Sizes in the North Netherlands', *O.H*. 95 (1981), pp. 31-49
- Miedema, H., 'Tekst en afbeelding als bronnen bij historisch onderzoek', in: H. Vekeman and J. Müller-Hofstede (eds.), *Wort und Bild in der niederländischen Kunst und Literatur des 16. und 17. Jahrhunderts*, Erftstadt 1984, pp. 7-16
- Miedema, H.,'Over vakonderwijs aan kunstschilders in de Nederlanden tot de 17de eeuw', *Leidsch Kunsthistorisch Jaarboek* 5-6 (1986/7), pp. 268-282
- Miedema, H., Kunst, kunstenaar en kunstwerk bij Karel van Mander; een analyse van zijn Levensbeschrijvingen, Alphen aan de Rijn 1989
- Miedema, H.; see: Mander, K. van Miedema, H., B. Meijer, 'The Introduction of Coloured Ground ...', *Storia dell'arte* 35 (1979), pp. 79-98
- Miedema, H., L.W. Meijer: 'De introduktie van de gekleurde schildergrond en de invloed daarvan op de stilistische ontwikkeling van de schilderkunst in het bijzonder in de Nederlanden van de 16de eeuw', *Proef* (July 1973), pp. 123-150

- Mills John, Raymond White, 'Paint Media Analyses', *National Gallery Technical Bulletin* 13 (1989), pp. 69-71
- Montias, J.M., *Artists and Artisans in Delft. A SocioEconomic Study of the Seventeenth Century*, Princeton 1982
- Mora, P., L. Mora, P. Philippot, *Conservation of Wall Paintings*, London/Boston etc. 1984, pp. 138-164
- Morrison, J., 'Sir George Reid in Holland; his work with G.A.Mollinger and Jozeph Israëls', *Jong Holland* 4 (1991), p. 24
- Muller, G., 'The Perseus and Andromeda on Rubens's house', *Simiolus* 12 (1981-82), pp. 131-146
- Müller-Hofstede, C., 'HdG 409, Eine Nachlese zu den Münchner Civilis Zeichnungen', *Konst- historisk Tidskrift* 25 (1956), pp. 42-55
- Müller-Hofstede, C., 'Das Stuttgarter Selbstbildnis von Rembrandt', *Pantheon* 21 (1963), pp. 6590 and 94-100
- Müller Hofstede, J., 'Rubens' erste Entwürfe für den Heinrichs-Zyklus', *Pantheon* 27 (1969), pp. 459-463
- Nicolaus, K., *DuMonts Handbuch der Gemäldekunde, Material, Technik, Pflege*, Köln 1979
- N(icolson), B., 'Current and forthcoming exhibitions', *Burlington Magazine* 105 (1963), pp. 224-227
- Obreen, F.D.O. (ed.), *Archief van de Nederlandsche Kunstgeschiedenis*, (7. vols.), Rotterdam 1877-90
- Ordonnance et règlement concernant le marché aux toiles de la ville de Gand, 1806
- Orlers, I.I., *Beschrijvinge der Stadt Leyden*, 2nd ed. Leiden 1641
- Pacheo, Francisco, *Arte de la Pintura, Su antiguedad y grandesaArtists' Techniques in Golden Age Spain*, Sevilla 1649, published by Zalura Veliz in: , Cambridge 1986
- Palomino, A., *El Museo Pictorico y Escala Optica*, Madrid 1715-24; ed. Aguilar, Madrid 1947
- Panofsky, E., *Idea*, 1960a2018
- Pauw-de Veen, L. de, *De begrippen 'Schilder', 'Schilderij' en 'Schilderen' in de zeventiende eeuw*, Brussel 1969
- Pels, A., *Gebruik en Misbruik des Toneels*, Amsterdam 1681
- Percival-Prescott, W., *The Lining Cycle. Fundamental Causes of Deterioration in Painting on Canvas: Materials and Methode of Impregnation and Lining from the 17th Century to the Present Day*, (National Maritime Museum), Greenwich 1974
- Pevsner, N., *Academies of Art, Past and Present*, 2nd ed. New York 1973 (1st ed. 1940)
- *Philostratus, Imagines*, London/Cambridge (Mass.) 1979
- Piles, R. de, Abregé de la vie des peintres, Paris 1699 Plesters, J., 'Photomicrographs of Cross-Sections of Paint and Ground Samples' in: 'The Ground in Pictures', *Museum* 21 (1968), pp. 245-276
- Plesters, J., 'The Examination of Paint CrossSections, with Special Reference to the Technique and Materials of Rembrandt', in: *Abstracts of the Symposium on Technical Aspects of Rembrandt Paintings*, Amsterdam 1970, p. 21
- Plesters, J., 'Tintoretto's Paintings in the National Gallery, Part II', *National Gallery Technical Bulletin* 4 (1980), pp. 32-46

- Plesters, J., L. Lazzarini, 'Preliminary Observations on the Technique and Materials of Tintoretto', in: *Conservation of Paintings and the Graphic Arts. Preprints of Contributions to The Lisbon Congress 1972*, pp. 153-180
- (Plinius) G. Plinius Secundus, *Naturalis Historia*, ed. Loeb, Classical Library (10 vols.), Cambridge (Mass.)/London 1958-62. Edition H. Rackham, London/Cambridge (Mass.) 1968
- Raupp, Hans-Joachim, 'Musik im Atelier, Darstellungen musizierender Künstler in der niederländischen Malerei des 17. Jahrhundert', *O.H*. 92 (1978), pp. 106-129
- Raupp, Hans-Joachim, *Untersuchungen zu Künstlerbildnis und Künstlerdarstellung in den Niederlanden im 17. Jahrhundert*, Hildesheim/Zürich/ New York 1984
- Regteren Altena, J.Q. van, 'De zoogenaamde voorstudie voor de Anatomische les van Dr. Deyman', *O.H*. 65 (1950), pp. 171-178
- Rembrandt after Three Hundred Years: A Symposium on Rembrandt and his Followers, October 22-24, 1969, The Art Institute of Chicago, Chicago 1973
- Reynolds, J., *Discourses on Art, 1769-1790*, 1778, ed. R.R. Wark, New Haven/London 1975
- Reznicek, E.K., *Die Zeichnungen von Hendrick Goltzius*, Utrecht 1961
- Riegl, A., *Stilfragen*, Berlin 1893
- Rosand, David, *Painting in Cinquecento Venice: Titian, Veronese, Tintoretto*, New Haven/ London 1982
- Rosand, David, 'Titian and the Critical Tradition', in: idem (ed.), *Titian, his World and his Legacy*, New York 1982
- Roscam Abbing, Michiel, *De schilder & schrijver Samuel van Hoogstraten 1627-1678, Eigentijdse bronnen & oeuvre van gesigneerde schilderijen*, Leiden 1993
- Royalton-Kisch, M., 'Rembrandt: Two Passion Prints Reconsidered', *Apollo* (febr. 1984), pp. 130-132
- Royalton-Kisch, M., 'Over Rembrandt en van Vliet', *De Kroniek van het Rembrandthuis* 1/2 (1984), pp. 3-23
- Royalton-Kisch, M., *Drawings by Rembrandt and his Circle in the British Museum*, London 1992
- Rubin, Laurie, 'First Draft Artistry; Children's Drawings in the Sixteenth and Seventeenth Centuries', in: *Children of Mercury; The Education of Artists in the Sixteenth and Seventeenth Centuries*, Providence/Rhode Island 1984, pp. 10-19
- Rudel, J., 'Le probleme du support dans l'histoire de la peinture', *L'information d'histoire de l'art* 7 (1962), pp. 158-164
- Ruffo, V., 'Galleria Ruffo nel secolo XVII in Messina', *Bolletino d'Arte* 10 (1916), pp. 21 ff
- Ruhemann, H., *The Cleaning of Paintings*, London 1968
- Ruurs, Rob, 'Matt oder Glänzend?', *Maltechnik/ Restauro* 89/3 (1983), pp. 169-174, reprinted in ICA Newsletter (Obelin, Ohio: Intermuseum Conservation Association) 16/1 (November 1985), pp. 1-6
- Sandrart, J. von, *Teutsche Academie der Bau-Bild- und Mahlerey Künste*, Nürnberg 1675; ed. A.R. Peltzer, Munich 1925
- Sayre, E.V., H.N. Lechtman, 'Neutron activation autoradiography of oil paintings', *Studies in Conservation* 13 (1968), pp. 161-185
- Schaible, V., 'Die Gemäldeübertragung. Studien zur Geschichte einer "klassischen Restaurier- methode"' *Maltechnik/Restauro* 89 (1983), pp. 96-129

- Schaible, V., 'Der Weg der Doubliertechniken. Versuch einer Zwischenbilanz', *Maltechnik/ Restauro* 89 (1983), pp. 250-256
- Schatborn, P., exhib. cat. *Figuurstudies; Neder- landse tekeningen uit de 17de eeuw*, Amsterdam/ Washington 1981-82
- Schatborn, P., *Tekeningen van Rembrandt, zijn onbekende leerlingen en navolgers. Catalogus van de Nederlandse tekeningen in het Rijksprenten-kabinet*, Amsterdam IV, Den Haag 1985
- Scheller, R.W., 'Rembrandt en de encyclopedi- sche kunstkamer', *O.H*. 84 (1969), pp. 81-147
- Scheller, R.W., *Exemplum: Model-Book Drawings and the Practice of Artistic Transmission in the Middle Ages (ca. 900 - ca. 1450)*, Amsterdam 1996
- Scheltema, P., Rembrand, *Redevoering over het leven en de verdiensten van Rembrand van Rijn*, Amsterdam 1853
- Schendel, A. van, 'Some comments on the cleaning of the Night Watch', *Museum* 3 (1950), pp. 220-222
- Schendel, A. van, 'Notes on the support of Rembrandt's Claudius Civilis', *Konsthistorisk Tidskrift* 25 (1956), pp. 38-42
- Schendel, A. van, H.H. Mertens, 'De restauraties van Rembrandts Nachtwacht', *O.H*. 62 (1947), pp. 1-52
- Schwartz, G., *Rembrandt, his Life, his Paintings*, London 1985
- Schweppe, Helmut, Heinz Roosen-Runge, 'Carmine', in: *Artists' Pigments, A Handbook of their History and Characteristics*, New York 1986
- Semper, Gottfried, Der Stil in den technischen und tektonischen Künsten, Frankfurt a. *M*. 1860/63
- Slive, S., Rembrandt and his Critics, 1630-1730, *The Hague* 1953
- Sluijter, E.J. et al., exhib. cat. *Leidse fijnschilders; van Gerrit Dou tot Frans van Mieris de Jonge 1630-1760*, (Stedelijk Museum de Lakenhal), Leiden 1988
- Smith, David R., '"I Janus": Privacy and the Gentlemanly Ideal in Rembrandt's Portraits of Jan Six', *Art History* 2 (1988), pp. 42-63
- Sonnenburg, H. von, 'Technical Aspects: Scientific Examination', in: *Rembrandt after Three Hundred Years: A Symposium*, Chicago 1973, pp. 83-101a2066
- Sonnenburg, H. von, 'Maltechnische Gesichtspunkte zur Rembrandtforschung', *Maltechnik/ Restauro* 82 (1976), pp. 9-24
- Sonnenburg, H. von, 'Rembrants "Segen Jacobs"', *Maltechnik/Restauro* 84 (1978), pp. 217-241
- Sonnenburg, H. von, 'Zur Maltechnik Murillos I. Teil', *Maltechnik/Restauro* 84 (1978), pp. 217-241
- Sonnenburg, H. von, 'Zur Maltechnik Murillos II. Teil', *Maltechnik/Restauro* 86 (1980), pp. 159-179
- Stifter, Adalbert, Der Nachsommer, Boedapest 1857; ed. *Bibliothek Deutsche Klassiker, Stifters Werke*, Band IV
- Strauss, W.L., M. van der Meulen, *The Rembrandt Documents*, New York 1979
- Stumpel, Jeroen, *The Province of Painting. Theories of Italian Renaissance Art*, Utrecht 1990
- Sumowski, W., *Gemälde der Rembrandt-Schüler* I, Landau/Pfalz 1983
- Talley, M.K., 'Extracts from the Executor's Account-Book of Sir Peter Lely, 1679-1691: An Account of the Contents of Sir Peter's Studio', *Burlington Magazine* 120 (1978), pp. 745-749

- Talley, M.K., Portrait Painting in England: Studies in the Technical Literature before 1700,…1981
- Talley, M.K., 'All Good Pictures Crack: Sir Joshua Reynolds' Practice and Studio', in: exhib. cat. *Reynolds*, London 1986
- Taylor, Paul, 'The Concept of Houding in Dutch Art Theory', *Journal of the Warburg and Coutauld Institutes* Vol LV (1992), pp. 210-232
- The Bridgestone Painting Research Group, *In Darkness and Light: A Rembrandt in Tokyo Reconsidered*, Tokyo 1989
- Thiel, P.J.J. van en C.J. Bruyn Kops, *Prijst de lijst. De Hollandse schiderijlijst in de zeventiende eeuw*, Amsterdam 1984
- Thiel, P.J.J. van, 'De Rembrandt-tentoonstelling van 1898', *Bulletin van het Rijksmuseum* 40/1 (1992), pp. 11-93
- Thieme, U., F. Becker (eds.) *Allgemeines Lexicon der Bildenden Künstler*, (37 vols.), Leipzig 1907-50
- Timmermans, Felix, *Pieter Brueghel; Zo heb ik u uit uwe werken geroken*, Amsterdam 1927
- Tümpel, C., Rembrandt, Reinback bei Hamburg 1977
- Tümpel, C., *Rembrandt*, Antwerpen/Amsterdam 1986.
- Vasari, Giorgio, Le vite de' piu eccellenti pittori, scultori, e architettori, 1568, ed. *Paola Barocchi*, Florence 1987; used edn. Lives of the Painters, Sculptors and Architects, translated by Gaston du C.de Vere with an introduction and notes by David Ekserdjian (2 vols.), New York 1996.
- *Vasari on Technique*, ed. G.B. Brown 1907, Dover publication, New York 1960
- Vasillov, M., 'Rhetoric and Fragments of a High Baroque Art Theory', *Marsyas* XX (1979/80), pp. 17-29
- Vey, H., 'Anton van Dijck – Über Maltechnik', *Bulletin van de Koninklijke Musea voor Schone Kunsten* 9 (1960), pp. 193-201
- Villers, C., 'Artists' Canvases. A History', *ICOM Committee for Conservation, 6th Triennial Meeting* 81/12/1, Ottawa 1981, pp. 1-12
- Vinci, Leonardo da, *Trattato della Pittura*, translated and annotated by A. Philip McMahon, (2 vols.), Princeton 1956
- Viollet-le-Duc, *Entretiens sur l'architecture*, Paris 1863-1872
- Vlieger, J.H. de, 'Historische verfschetsen VII, De Oudhollandse methode om loodwit te maken', *Verfkroniek* 62 nr1 1989, pp. 21-26
- Volpato, Giovanni Battista, 'Modo da tener nel dipingere', reprinted in: M.P. Merrifield (ed.), *Original Treatises on the Arts of Painting*, New York 1967 (1st ed. 1849), pp. 726-755
- Voorn, H., *De papiermolens in de provincie Gelderland, alsmede in Overijssel en Limburg*, Haarlem 1985
- Vries, A.B. de, M. Tóth-Ubbens, W. Froentjes, Rembrandt in the Mauritshuis. *An Interdisciplinary Study, Alphen aan de Rijn* 1978
- Wagenaar, J., Amsterdam, in zyne opkomst, aanwas, geschiedenissen etc., (4 vols.), *Amsterdam* 176067, 1802
- Walsh, John, 'The Dutch Marine Painters Jan and Julius Porcellis', *Burlington Magazine* 116 (1974), pp. 653-662 and 734-745
- Watrous, James, *The Craft of Old-Master Drawing*, Madison/Milwaukee/London 1967
- Wattenbach, W., *Das Schriftwesen im Mittelalter*, 2nd ed., Leipzig 1875

- Wazny, T., D. Eckstein, 'Der Holzhandel von Danzig/Gdansk- Geschichte, Umfang und Reichweite', *Holz als Roh- und Werkstoff* 45 (1987)
- Wechsler, B., 'Cleaning Controversy: Zur Diskussion der Gemäldereinigung in England von 1946-1963', *Zeitschrift für Kunsttechnologie und Konservierung* 1 (1987), pp. 88-132
- Wehlte, K., 'Altholländische Spannmethode für Gewebe', *Maltechnik* 63/64 (1957/58), pp. 38-42
- Wetering, E. van de, 'Leidse schilders achter de ezels', in: exhib. cat. *Geschildert tot Leyden Anno 1626*, Leiden 1976-1977, pp. 21-31
- Wetering, E. van de, 'De jonge Rembrandt aan het werk', *O.H.* 91 (1977), pp. 27-65
- W(etering), E. van de, 'Problems of Apprenticeship and Studio Collaboration', *Corpus*, II, p. 45-90
- Wetering, E. van de, 'Isaac Jouderville, a pupil of Rembrandt', in: exh. cat. *The Impact of a Genius, Rembrandt, his Pupils and Followers in the Seventeenth Century*, Amsterdam 1983, pp. 59-69
- Wetering, E. van de, 'Het formaat van Rembrandts "Danae"', in: *Met eigen ogen. Opstellen aangeboden door leerlingen en medewerkers aan Hans*. L. C. Jaffé, Amsterdam 1984, pp. 67-72
- Wetering, E. van de, 'De paletten van Rembrandt en Jozef Israëls, een onderzoek naar de relatie tussen en schildertechniek', *OH* 107 (1993) pp. 137-151
- Wetering, E. van de, 'Rembrandt's Satire on Art Criticism Reconsidered', in: *Shop Talk, Studies in Honor of Seymour Slive: Presented on his Seventy-Fifth Birthday*, Cambridge (Mass.) 1995
- Wetering, E. van de, 'Is een schoongemaakte Rembrandt een Rembrandt?', *Radar, stand van zaken in de wetenschap* 96 (1996), pp. 111-122
- Wetering, E. van de, 'De Schilder', in: *Gestalten van de Gouden Eeuw. Een Hollands groepsportret*, Amsterdam 1996, pp. 219-239
- Wetering, E. van de, ""The Miracle of our Age", Rembrandt through the Eyes of his Contemporaries', in: A. Blankert e.a., *Rembrandt: a Genius and his Impact*, Melbourne/Zwolle 1997
- Wetering, E. van de, M. Franken, P.G.T. Broekhoff, e.a. *A Corpus of Rembrandt Paintings*, vol. IV, Dordrecht/Boston/London (to be published in 1998)a2115
- Wetering, E. van de, C. M. Groen and J. A. Mosk, 'Summary Report on the Results of the Technical Examination of Rembrandt's Night Watch', *Bulletin van het Rijksmuseum* 24 (1976), pp. 69-98
- Weyerman, J.C., *De Levens-beschrijvingen der Neder- landsche Konstschilders en Konst-schilderessen*, Dordrecht 1769
- Wheelock, Arthur K., Susan J. Barnes, Julius S. Held, e.a., exhib. cat. *Anthony van Dyck*, (National Gallery of Art), Washington 1990/91.
- White, C., *Rembrandt*, Den Haag 1964, with notes by H.F. Wijnman
- White, C., *Rembrandt as an Etcher*, London 1969
- White, C., K.G. Boon, *Rembrandt's Etchings*, an Illustrated Critical Catalogue, (2 vols.) Amsterdam/London/New York 1977
- White, Raymond, Jo Kirby, 'Rembrandt and his Circle: Seventeenth-Century Dutch Paint Media, Re-examined', *National Gallery Technical Bulletin* 15 (1994), pp. 64-78

- White, Raymond, Jennifer Pilic, 'Analyses of Paint Media', *National Gallery Technical Bulletin* 14 (1993), pp. 86-94
- Wijnman, H.F., 'Rembrandt als huisgenoot van Hendrick Uylenburgh te Amsterdam (16311635). Was Rembrandt Doopsgezind of Libertijn?', in: idem, *Uit de kring van Rembrandt en Vondel*, Amsterdam 1959, pp. 1-18. An earlier version of this article was published in: Amstelodamum, Maandblad ... 43 (1956), pp. 94-103
- Witsen, N., *Aeloude en Hedendaegsche Scheepsbouw en Bestier*..., Amsterdam 1671
- Wölfflin, Heinrich, *Kunstgeschichtliche Grundbegriffe*, Munich 1915; English ed.: Principles of Art History, trans. M.D. Hottinger, New York 1932 (Wolters, C.J.), 'Fabric paint supports', Museum 8 (1960), pp. 135 ff.
- Woordenboek der Nederlandsche taal, The Hague 1882-….
- Worp, J.A., 'Constantijn Huygens over de schilders van zijn tijd', *O.H*. 9 (1891), pp. 106-136
- Wurfbain 'Vanitas-stilleven; David Bailly (1584-1657), *Openbaar Kunstbezit*, 1969, 7

[h1] Glossary

a2131For a useful survey of materials and techniques in the history of painting, see the series Art in the Making published by The National Gallery, London. The first volume of this series, by David Bomford, Christopher Brown and Ashok Roy, is devoted exclusively to Rembrandt.

Aanleggen
See MANIERA LAVATA.

Aemulatio
Latin: striving to do as well as another.

Aerial Perspective
Changes in colour and tone of an object in a given (picture) space due to (presumed) atmospheric influence on the visibility of the object.

Alterstil
The late style of certain older artists who have developed to a point where they no longer conform to any style currently prevalent. Such a style is subsequently often experienced as visionary. A classic example from music is the late string quartets of Beethoven.

Autograph Retouches
See RETOUCHING.

Batten
A thin strip of wood

Bevelling
In panel-making: (giving) a sloped or slanted edge to a panel board in order to fit it in a frame.

Binding Medium

Ingredient of a paint which binds the pigment particles into a cohesive layer and attaches it firmly to the ground, at the same time influencing the structure of the paint surface.

Bolt

A roll of woven fabric, usually of a defined length e.g. 28 ells.

Breed-Doek

Dutch: sailcloth.

Brushability

The behaviour of a paint under the brush. See RHEOLOGY.

Butt-Joint

In panel-making: a joint in which the parts do not overlap but merely abut against each other.

Campo

Term for background in Italian painting.

Chalk

Opaque, soft white limestone. Whiting is the native calcium carbonate, used for preparing primings or an inert filler to mix with lead white.

Chiaroscuro

Italian: literally, light/dark. A term used of pictorial style or technique: the use of contrasting light and dark masses to render forms and create an illusion of depth and space from which principle figures emerge.

Chromatography

A technique developed originally for the separation and identification of low molecular weight, organic compounds that have different solubilities in different phases, one stationary and another mobile.

Colorito

Italian: coloured or painted; as an art theoretical term, referring to the use of colour as distinct from design; also used as a term for working from nature cf. disegno.

Coloured Ground

A ground whose colour serves as an intemed- iate tone over which both light and dark passages can be worked.

Cortegiano

Italian: courtier.

a2132Cradling System

A system of battens attached to the back of a panel to prevent it from warping (see figure 10). This system, developed in the 18th century, was widely used until the 20th century. The damage caused by the practice of planing and cradling has destroyed much information from the backs of panels.

Cusping (Primary, Secondary -)

A scalloping of the weave pattern that occurs when a piece of untreated linen is stretched in a frame for priming. These local distortions become fixed in the fabric when the ground sets. Secondary cusping may appear when the canvas is re-stretched before the ground has fully set.

Dead Colour

Originally, a term for monochrome underpainting mostly in greys or browns; subsequently the term was used more generally for different types of underpainting. Nowadays obsolete, the term is used here in its historical context.

Dendrochronology

Dating of wood (in this context, of panels) by matching the pattern of growth-rings in the wood. Origins of tree-ring dating go back to Leonardo da Vinci, who first noted that the annual growth of trees produces a sequence of variable annual rings in the wood. This pattern of variation is due to variable growth conditions from one year to the next.

Diagraphy
: The practice of drawing on a prepared boxwood tablet.

Disegno
: Italian: design or drawing; also used as a term for working from the imagination.

Dowel
: In panel-making: a cylindrical rod serving as a pin to fasten two boards of a panel. Hence a dowelled joint. Panels were thus constructed up to the 1620s.

Drier
: See siccative.

Ell
: A unit of length, now obsolete; used in the measurement of fabric. Variable according to country, town or region. A Flemish ell was 69 cm.

Emulsion
: A suspension of a liquid in another with which it is not miscible e.g. water dispersed in oil. To make an emulsion stable, an emulsifier, or emulsifying agent is required which will form a film round minute globules and prevent them coalescing

Fama
: Latin: the public opinion, or reputation of an individual.

Fortuna
: Latin: luck, fate, fortune. In painting, making use of random forms to invent an image.

Fourier Transform Infrared Spectrometry
: Method for the analysis of compounds based on the absorption of infra-red radiation. In the modern method, the resulting pattern of infrared wavelengths transmitted is processed mathematically using Fourier analysis.

Gallery Tone

A yellowish or brownish patina on a painting; often deliberately created by the application of tinted varnish.

Gas Chromatography-Mass Spectrometry

A combined technique. The sample products separated by gas chromatography are analysed by mass spectrometry.

Giornata

The area of wet plaster in fresco painting that can be painted in one day.

Glaze

A layer of translucent paint.

Ground

A coating layer or combination of layers which covers the support and prepares a surface to receive the paint itself.

Guilder Size

c. 75 x 90 cm. See standard sizes.

High Performance Liquid Chromatography

See chromatography. In liquid chromatography, the mobile phase is a liguid (cf. gas chromatography). In modern high performance chromatography, the liquid solution is forced through a column under high pressure.

Houding

Dutch term for the creation of a convincing spatial effect in a painting by an appropriate gradation of colours and tones in the different planes of the picture space.

Idea

Not used in the sense as today. For Plato: the Forms or Ideas are those entities which are not accessible to the senses. In the 17th century, on the contrary, ‘ideas' were ‘given' in experience, they

were received by the mind, either from sensory perception or by inner reflection.

Illusionism
: The use of pictorial techniques to create in an artwork the illusion of reality. See also trompe l'oeil.

Impasto
: Paint applied in thick layers or heavy strokes; also, any thickness of roughness of paint, or deep brushmarks, as distinct from a smooth paint surface.

Imprimatura
: A thin layer of oil paint applied as a final layer to a ground in order to determine its colour.

Invention
: Art theoretical term for the development of a composition or, in the case of historical painting, a narrative concept, in the mind and/or by sketches.

Kenlijkheyt
: Dutch, obsolete: perceptibility. The term was used to refer to the way that pictorial space is perceived in a surface image as a result of visual cues. Roughness in the surface structure focusses the eye and leads the viewer to perceive forms thus painted as foregrounded.

Koningsgeel
: Dutch: literally, ‘royal yellow'. The term was used for either rusgeel or masticot.

Kunstwollen
: German term introduced by Alois Riegl (1858-1905). Literally ‘the will to art'; the idea of an inherent urge to form as opposed to an art determined by technical or evolutionary factors.

Lay-In

A term denoting the provisional or outline composition established by the initial underpainting. Also synonym for underpainting.

Lead White

Basic lead carbonate, one of the oldest manufactured pigments, dating back to the earliest European (and Chinese) civilizations. Used in oil paints, it is a good drier, has excellent brushing qualities and forms a tough, lasting paint film.

a2133Leerkinderen

Young trainees in the guild system.

Lining

In the conservation of paintings, the process of fixing fresh linen to the back of an old canvas that has deteriorated through age. The ground and paint layers need to be re-attached to the old canvas, and in some techniques this is accomplished in the process of lining.

Loom

A machine in which yarn is woven into fabric.

Lossigheydt

Dutch: literally, ‘looseness'. Nonchalance. A Dutch term for sprezzatura.

Maniera Lavata

Literally, washed style. The application of a thin, flat layer of paint on a given passage in a painting (e.g. a red layer for a red garment) to be used as a base to carry out the modelling of that part of the painting. A Dutch term is aan- leggen.

Mass Spectrometry

A research method of physicists and chemists for studying atomic and molecular composition and the analysis of samples of unknown organic components. A mass Spectrometer is the instrument used.

Masticot, Or Massicot

17th century term for lead-tin yellow; binary oxide of lead and tin, a manufactured artist's pigment widely used between 1300 and the early eighteenth century. A thick, opaque paint which shows up prominently in X- radiographs. The term is also used to refer to a yellow lead oxide.

Maulstick Or Mahlstick

A light, wooden rod, about one metre long, used by the painter as a support to steady the hand in the execution of fine or detailed work.

Metal Stylus

Any small, pencil-shaped metal instrument with shard point, for inscribing (e.g. silverpoint) or for incising lines in a soft surface (e.g. wax).

Neutron-Activation Autoradiography

Autoradiaography: the radiation emitted in the disintegration of radioactive isotopes (to be found in certain pigments) shows up black on radiation-sensitive film. In this technique, neutron irradiation of the painting makes chemical elements in the pigments radioactive, which then decay with characteristic halflives. By taking autoradiographs at different times, pigments with specific elements like mercury in the case of vermilion or phosphor with bone black show up on different autoradiographs.

Nova Reperta

Inventions not known in classical antiquity; illustrated in a series of prints after the work of Johannes Stradanus (1566-1628).

Ochre

Earth colour pigments, yellow, brown or red, sometimes green, or clay used to make these pigments. Often used as synonym for yellow ochre.

Ordineren

Dutch: arranging. As distinct from composition, the arrangement of figures, objects, buildings etc. in a given picture space.

Ordonnantie
See ordineren.

Papier A Tablette
See tafelet.

Pasteuse
From impasto.

Peinture
Specific quality of the brushwork of a painter.

Pentimento (Also Repentir)
The change by the artist in a given passage of a painting. Such changes may show up at the surface due to the increasing transparency of the top layers with age.

Pinceliere
Container filled with oil to prevent brushes drying out.

Pittura Di Macchia
Italian: literally, `painting in blotches'; visible brushstrokes that do not necessarily correlate with the rendered forms.

Planing Down
In this context, the smoothing of the rough surface of a panel back with a plane, before applying a cradling system.

Polymerization
A chemical change in which individual molecules of a compound (monomer) are combined and rearranged as new,long chain molecules of high molecular weight (the polymer).

Pressbrokat

A technique used in the late middle ages in polychrome sculture and painting. Tin foil, pressed in relief, is glued in 'rapport' onto a given surface and painted in an effort to imitate brocade fabric.

Primer

The white ground or coating applied over a coat of size to a surface to prepare it for painting. See priming.

Priming

Application of a primer, or white ground, before beginning painting. This provides a white base and stable structure, and gives suitable texture and absorbency on which to paint. The term is also sometimes used as a synonym for ground, but throughout this book a distinction is implied between the main application of primer and subsequent imprimatura or primuersel.

Primuersel

A 16th and 17th century Dutch term for a thin layer of oil paint applied to the priming to give a yellow (or grey) colour to the ground. It also served to isolate the ground and prevent leaching of oil from the paint layers above.

Pyrolysis Mass Spectrometry

Mass spectrometric analysis of components of compounds broken down by the action of heat.

Quartz

The crystalline mineral silica, or silicon dioxide, which is the main constituent of sand. In powdered form, silica is used as an inert pigment in grounds for canvas.

Rabbet

In joinery: a slot, shoulder or ledge cut along the edge or face in one member of a construction, e.g. the back of a frame, to receive the edge or end of another member, e.g. a panel.

Radioabsorbent Paint

Irradiation of a painting results in the particular wavelength passing through some materials (pigments, binding media etc.) and being absorbed by others. Radioabsorbent paint shows up in X-radiographs. Layer of lead white or lead-tin yellow, but also thick layers of less radioabsorbent paint may thus be studied by X-radiography independently of their visibility at the paint surface.

a2134Reconstruction Research

Reconstruction of an historical technique on the basis of actual or hypothetical data in order to discover empirically more about the given technique.

Red Lakes

Organic red pigments used in glazing technique. See glaze.

Reed

In weaving: an instrument for separating the threads of the warp and beating up the weft, formerly made of thin strips of reed or cane.

Refractive Index

The ratio between the speed of light in air and its speed in the substance. The greater the difference between the r.i. of a paint layer and the medium above, the more light will be reflected at the interface and the less absorbed. A significant factor in determining the colour value of a paint.

Repentir

See pentimento.

Reserves

Darkish form in X-radiographs resulting from the painter working round these shapes while executing passages that lie further back in the pictorial space of the painting.

Retouching

Making changes or adding details to a finished picture by going over it with fresh paint. In the case of autographa retouching, this

work is done by the original artist himself. In restoration retouching, it is the restorer who retouches damage in the paint suface.

Reuezug
See PENTIMENTO.

Rheology
The branch of physical science dealing with the deformation (plasticity) and flow behaviour of materials under mechanical forces.

Rhineland Foot
31.39 cm.

Rough Manner
Dutch: ruwe manier: a 17th century term referring to a way of painting in which the brushstrokes are visible and sometimes crude or casual. See also sprezzatura.

Rusgeel
Dutch: literally, 'Russian yellow'. Orpiment, a naturally occurring mineral, arsenic trisulphide, which was also manufactured as an artists' pigment.

Sackcloth
Coarse, woven fabric, of flax, jute or hemp, used for making sacks or wrapping bales.

Salvator
c. 60 x 47 cm. See standard sizes.

Scalloping
Pattern of scallop-shaped distortions in a material stretched between the nails or threads that fasten it to a frame.

Scheme, Or Schema

Dutch: stelsel, from stellen: to put into place. A simple, generalized sketch in any material, including oil paint, used as a guide to the intended composition. See also dead colour.

Schijtgeel
: An organic yellow pigment prepared from the weld plant, Reseda luteola L.

Schutters
: The members of a citizens' shooting association founded originally as a vigilante organization for the protection of the community.

Selvedge
: The edge of a woven fabric.

Sfumato
: From the Italian word fumo, smoke or vapour. The creation of an atmospheric effect in a painting by blurring the outlines of shapes.

Siccative
: Material component of paint which has a drying effect.

Silverpoint
: Line drawings made by silver point technique. A pointed rod of silver, drawn across a paper or parchment coated with the crushed, calcined bone of sheep or chicken, leaves a trace of silver particles on the white ground, producing a greyish, eventually brownish, line. See also tafelet.

Smalt
: A blue pigment, no longer used, consisting of ground glass coloured with cobalt oxide. It was prepared by roasting cobalt ores with molten glass, and the black lumps so formed were ground to give the pigment. A standard pigment of the 17th century, made obsolete in the early 18th century by the introduction of prussian blue.

Smooth Manner

Dutch: fijne manier: a 17th century term referring to a way of painting in which a high degree of finish is aimed at and the brushstrokes are (almost) invisible.

Sprezzatura
Apparent carelessness in a painting; giving it the effect of having been executed without effort.

Standard Sizes
Fixed sizes used in the 17th century production of panels and canvases.

Stellen
See scheme.

Strainer
A kind of chassis for mounting canvas that has rigidly joined corners, and therefore cannot be expanded.

Stretcher
An expansible wooden frame, or chassis on which an artist's canvas is stretched by pulling it tight and tacking it to the frame all the way round. The expansible corners allow for subsequent slackening of the canvas. In use since c.1750 (See also strainer).

Stretching (Canvases)
Making the canvas taut. See stretcher.

Strip Width
The width of cloth as it comes from the loom.

Stuiver Size
See STANDARD SIZES.

Tabulis Ex Pergameno
See TAFELET.

Tafelet

Dutch equivalent of Italian tavola, tavoletta. An erasable tablet for drawing or writing. The Dutch 'tafelet' could also denote a booklet with erasable pages.

Tavola, Tavoletta
See TAFELET.

Terre Verte
French term for Green earth. A native clay containing iron silicate, a pigment occurring in willow or celadon shades of green.

Thin Layer Chromatography
See chromatography. In thin layer chromatography, the separation of the mixture of compounds to be analysed is carried out on a sheet of glass coated with a thin layer of absorbent material (e.g. silica gel or cellulose).

a2135Thixotropy
The property of some viscous or gel materials of changing consistency when stirred or rubbed i.e. when subjected to shearing forces.

Thread Density
The number of threads per cm in both warp and weft of a fabric.

Tongue And Groove
In panel-making: profiling of wooden boards such that the projecting strip on one board fits into the groove along the edge of an adjacent board.

Topos
Greek: a commonplace. Recurrent device or formula. More usually a term in poetics.

Trompe L'Oeil
French: deception of the eye; painting that uses perspective and other means, e.g. placing the subject parallel to the picture space,

so as to create an illusion of depth which fools the viewer into thinking he is looking at real rather than painted objects.

Twill Canvas
Canvas that has a diagonal weave rather than a square one.

Ultima Maniera
Italian: literally, ‘last style'. See alterstil.

Underdrawing
Sketch or more detailed drawing done by the painter directly on the ground. The term came into use when it became possible through infra-red radiography to make these drawings, which are normally hidden beneath paint, visible.

White Ground
see ground. Used in the 15th and part of the 16th century, and since Impressionism in 20th century studio practice.

Underpainting
The first coat of paint applied to a prepared surface, preliminary to working up. See dead colouring, lay-in

Usus
Latin: using, or making use of (in the widest sense); also the routine or practicing of a craft.

Vanitas
Latin: the transitoriness of all things.

Vellum (Prepared)
A fine parchment made from the skins of newborn calves or lambs.

Verdaccio
Green, flat underpainting used under flesh tones in early Italian painting.

Vernice Liquida

A dark, viscous, cooked oil and resin mixture used as a varnish by mediaeval and early Ren- naissance tempera painters.

Vidimus

Design for a given work of art to show to a patron for his approval.

Viscosity

The resistance of a liquid to flow. Thick, heavy liquids have a high viscosity.

Voc

Verenigde Oostindische Compagnie: the (Dutch) East India Company.

Warp And Weft

In weaving: the threads extended lengthwise in the loom are the warp, usually twisted harder than the weft with which these are crossed to form the fabric.

Wet-In-Wet

Application of paint to a surface already (partially) covered by a wet coat e.g. oil paint into wet oil paint.

Working-Up

Execution of the final stage of a painting, bringing it to a desired finish. [The Dutch term used here is ‘opmaken', literally, to finish. Many paintings might be left at the underpainting stage until a client requested one, which would then be ‘worked up'].

X-Ray

See RADIOABSORBENT PAINT.

Yarn

Fibre spun and prepared for weaving etc.

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[h1] Concordance

Ernst van de Wetering

[H2] CONCORDANCE I

a2150*In the first column the Bredius numbers of the paintings by or at one time attributed to Rem- brandt are listed as far as these paintings are dealt with and illustrated in this book. Bredius numbers with an a are only published in the 1969 Bredius/ Gerson edition.*

In the second column one finds the corres- ponding figure numbers. Of these paintings only the figure numbers of the (nearly) complete images are listed. Numbers in brackets refer to paintings of which only technical photographs are repro- duced.

In the third column the corresponding num- bers in Volumes I-III of A corpus of Rembrandt Paintings are to be found (these volumes deal with paintings up to 1642).

Not included in this list are the paintings dealt with in the Tables in Chapter II, V and IX as far as these are not illustrated in this book, and paint- ings referred to in passing in the text.

Bredius	The Present Book	CORPUS
6	203	A21
17	1	A58
18	21	A71
42	272	–
48	spine	–
50	284	–
51	283	–
52	254	–
53	170	–
55	212	–
60	331	–
61	306	–
62	(126)	–
69	316	A37
81	13	A42

Bredius	The Present Book	CORPUS
103	293-296	A112
119	265	-
120	ix	-
145	(10)	-
157	frontispiece/ Inside Dust Jacket	-
161	Inside Dust Jacket	A57
164	141	A54
200	164	A98
207	(14)	C102
218	309	A144
276	205	–
279	271	–
321	189	–
323	297a /297b	–
330	142	A55
347	165	A99
354	214	A103
356	109	A131
360	310	A145
395	289	–
403	250	A51
408	144	A77
410	245	A146
414	274	–
415	239	–
416	173	–
417	209	–
419	102	A18
437	210	-
440	22	A136

[H2] A2152CONCORDANCE II

In the first column the paintings dealt with and illustrated in this book are listed by figure numbers referring to the illustrations. All details and repro- ductions of technical photographs are included in this list.

In the second column the corresponding Bredius and Bredius/Gerson numbers are listed, in the third column the Corpus numbers.

Present Book	Bredius	Corpus
1	17	A58
6	460	A6
7	–	A5
8	132	A8
10	145	A43
13	81	A42
14	207	C102
15	–	–
16/17	632	A7
18/19	460	A6
20	–	A5
21	18	A71
22	440	A136
23	–	A5
24	460	A6
26/27	476	A135
28	489	A24
29-30	–	A5
33/34	632	A7
37-39	460	A6
40/41	487	A2
42/43	538	A30
51	465	C9
101	504	A66
102	419	A18
103/105/106	539 A	A15

Present Book	Bredius	Corpus
107	555	A106
109	356	A131
111	574	–
118	61	–
120	497	A110
121	164	A54
122	103	A112
123-125	456	A134
126/127	62	–
128	–	A108, COPY 1
129	497/ –/ 469	A110/ A108 COPY 1/ A114
130/132	544	A88
131/133	470	A91
134	603	–
135	499	A109
136/137	565	A107
139/141	164	A54
140/142	330	A55
143	405	C67
144	408	A77
156	525	–
158	501	A116
159/161	474	A119
162/163	497	A110
164	200	A98
165/166	347	A99
167	467	A70
170	53	–
173	416	–

Present Book	Bredius	Corpus
182	604	A28
183	488	A9
185/186	467	A135
187	547	A137
188	416	–
189	321	–
191 -202	416	–
203	6	A21
204	52	–
205/206	2	76
209	417	–
210	437	–
211	525	–
212/213	55	–
214	354	A99
216/218 /220	632	A7
227	487	A2
232	602	A26
236-238	604	A28
239-242	415	–
245-249	410	A146
250	403	A51
254	52	–
255-263	410	A146
265	119	–
266	52	–
267-269	323 A	–
270	527	–
271	279	–
272/273	42	–
274-280	414	–
281/282	525	–
283/285	51	–

Present Book	Bredius	Corpus
284/286	50	–
289/290	395	–
293-296	103	A42
297 a, b	323	–
298	416	–
299/300	415	–
301	416	–
302	395	–
303-305	416	–
306	61	–
307/308	410	A146
309	218	A144
310	360	A145
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314	501	A116
316	69	A37
317	-	A5
318	441	A137
320	521	–
328	452	–
329	463	A39
331	60	–

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[h1] Photo Acknowledgements

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[H2] AMSTERDAM

Amsterdams Historisch Museum figs. 274, 276 fom-Institute *fig. 303*

Gemeente-archief *figs. 2, 324*

René Gerritsen *figs. 33, 87, 182, 184, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 223, 224, 237, 238, 240, 243, 246, 249, 252, 253, 260, 298, 299*

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Netherlands Institute for Cultural Heritage *figs. 7, 9, 19, 20, 23, 24, 30, 31, 36, 39, 115, 129, 153, 154, 155, 160, 216, 217, 218, 219, 220, 221, 256, 263, 300, 301, 305, 307, 308*

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Rembrandt Research Project *figs. 18, 34, 74, 106, 120, 122, 123, 124, 126, 127, 128, 130, 131, 139, 140, 143, 152, 156, 225, 234, 235, 273, 277, 278, 279, 280, 293, 294, 294, 295, 296*

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Ernst van de Wetering *figs. 172, 311*

[H2] ANTWERP

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[H2] BUDAPEST

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[H2] CAMBRIDGE

Fitzwilliam Museum *fig. 112a*

[H2] CHATSWORTH

Chatsworth Settlement *fig. 98*

[H2] CHICAGO

The Art Institute *fig. 13*

[H2] CLEVELAND

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[H2] COLOGNE

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[H2] COWDRAY PARK

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[H2] DENVER

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[H2] DUBLIN

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[H2] DUISBURG

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Mauritshuis *figs. 250, 251*
Collection Noordman *fig. a*
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[H2] MEERSSEN

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[H2] NEW YORK

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[H2] PASADENA

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[H2] RAVENSBURG

Otto Maier Verlag *fig. 177*

[H2] ROTTERDAM

Museum Boijmans Van Beuningen *figs. 26, 27, 48, 49, 114, 117, 208*
Rotterdams Historisch Museum *figs. 84, 85*

[H2] ST. PETERSBURG

Hermitage *figs. 159, 161*

[H2] STUTTGART

Staatsgalerie *fig. 15*

[H2] SWITZERLAND

Private collection *fig. 168*

[H2] UTRECHT

Het Catharijne Convent *figs. 11, 29, 317*

[H2] VADUZ

Collections of the Prince of Liechtenstein *fig. 133*

[H2] VERONA

Museo del Castelvecchio *fig. 58*

[H2] VIENNA

Akademie der bildenden Künste *fig. 142*

Albertina *figs. 97, 327*

Kunsthistorisches Museum *figs. 134, 272*

[H2] WASHINGTON D.C

National Gallery of Art figs. 283, 285